

PC & TECH AUTHORITY

TECH ADVICE YOU CAN TRUST

CLOUD CHOICES 10 SERVICES COMPARED

ONEDRIVE • ICLOUD • GOOGLE DRIVE • DROPBOX • BOX
LIVEDRIVE • MOZY • SUGARSYNC • BOX • CLOUDDRIVE



GROUP TEST

EVERYDAY LAPTOPS

• Solid machines you can trust
• Tested & recommended

FREE DVD FREE SOFTWARE

- + ASHAMPOO MUSIC STUDIO 5
- + BACKUP4ALL 5 LITE
- + MYKEYFINDER 2015
- + XYPLORER 15
- + TINY CORE LINUX



HOW TO:

- DOUBLE YOUR WI-FI SPEED
- THE BEST APPS TO BUILD YOUR BUSINESS



OVERSHARING
SIMPLE SLIP UPS THAT CAN WRECK LIVES

AU\$9.95 Inc. GST
NZ\$9.95 Inc. GST



ISSUE 212 JULY 2015

“Get more from your
Smartphone!”

ware

Enhance your electronic experience



i200 Portable Bluetooth Speaker

This portable speaker can produce loud and clear audio from **Bluetooth** compatible devices + **charge** your mobile devices with its built-in **powerbank**!

- Portable speaker
- Portable Power Bank
- FM Radio
- The latest Bluetooth 2.1+EDR Class 2 Bluetooth



MUSIC



POWER



RADIO

6-Port Desktop USB Charging Station

Don't over load your power boards or outlets, grab this USB wall charging station! It packs 6 USB ports so you can charge up to 6 devices at the one wall socket.

- 3 x 2.4A ports for Tablets
- 3 x 1A ports for Smartphones & other digital devices
- AC input 100-240V worldwide travel compatible
- Ideal for home, office or for travel use



10A Smart Socket

Remotely control your home appliances and devices using a Wi-Fi Smart Socket.

- Compatible with most Smartphones and Tablets
- Energy saving via program timers & schedules
- Easy Setup
- Remote access via the iOS and Android App

Available from:

scorptec

www.scorptec.com.au
1300 726 770

harristechnology

www.ht.com.au
1300 13 9999

storm
COMPUTERS

www.stormcomputers.com.au
(08) 9258 8422

mwave.com.au
Australia's Largest Online Tech Retailer

www.mwave.com.au
1300 727 446

Distributed by: **Anyware**

The Home of Computer Accessories
1300 269 927
www.anyware.com.au

NICE THINGS

It's always nice to be impressed

I've really enjoyed playing with some outstanding tech over the last couple of months. Some notable winners have been gear that's superbly designed and manufactured, and are just beautiful to behold. That would obviously include the 12 inch MacBook, which is included in this month's laptop group test. One simply cannot hold this lovely thing and not fall for its meticulously machined aluminium, its thinness and surprisingly light weight.

For just the same reasons the Dell XPS 13, also in the group test, is a stunner. Its just as small and thin and light, but with a different take on aesthetics. Long gone are the days of old when Dell meant 'bland'. Sure, the company still excels in supreme blandness in its enterprise segment, but it would be fair to say that those are designs pitched precisely to a particular buying eye.

Another catching design is of course the Surface, both Pro and its baby brother. Yes, the magnetically detachable keyboard is very nice, but it's the case itself that's so sweet. Magnesium is light and strong, and as long as you can avoid heating it up to about 650 degrees it's great stuff. Over 650 degrees and it will ignite, and burn away until there's nothing left. I mention this only because it's pretty funky stuff, though we haven't heard about any Surface machines doing the flame-on thing, so presumably it's a non issue. No, what's impressive is the method used to manufacture the case. Known as VaporMG, it's a melt it then mould it technique, which I'm told is quite an engineering achievement with this material, and to get it all with a perfectly smooth finish. All I know is it's light, cool and feels great to touch.

I'm also thoroughly enjoying

experimenting with the emerging new monitor technologies for gamers. AMD's FreeSync and Nvidia's G-Sync really are game changers. They work by providing a compatible monitor with game frames that aren't limited by v-sync so are silky smooth, but don't display the tearing you get when v-sync is off. It really is magical. I haven't seen a game run so smoothly since GL Quake on a CRT in the 1990s.

For all practical purposes FreeSync and G-Sync deliver the same result, although FreeSync monitors currently can't do their magic below (in most cases) 48Hz - or 48 frames per second. It's a small matter, the bigger issue is compatibility. As it stands a monitor can support only one or the other, though AMD's solution is open, and costs nothing to add the technology to a monitor for manufacturers. Nvidia, with its love of proprietary standards, asks for around \$100 extra for each G-Sync monitor in manufacturing cost - money that goes straight from our pocket to Nvidia. Frankly I hope FreeSync wins this battle. I'm tired of Nvidia's bullying shenanigans, and let's not get started on the GameWorks program and its goal of hurting AMD performance on any supported game.

Until next month, and we're off to Computex!



Ben Mansill
Editor

bmansill@nextmedia.com.au

REAL TECH ADVICE YOU CAN TRUST!

- Our tests are performed by experienced reviewers in our Labs in accordance with strict benchtesting procedures
- Our brand new benchmarks have been tailor-made to reflect real-world computing needs
- We put tech through its paces - seriously. From processing power to battery life, from usability to screen brightness, our tests are exhaustive
- We will always offer an honest and unbiased opinion for every review

THE TEAM...



Digital Editor

David Hollingworth

E dhollingworth@nextmedia.com.au
T @atomicmpc



Senior Labs Editor

Bennett Ring



Advertising Manager

Jo Ross

E jross@nextmedia.com.au



Art Director

Tim Frawley

E tfrawley@nextmedia.com.au

CONTACT US...

Call us (02) 9901 6100

E-mail us

inbox@pcandtechauthority.com.au



Facebook

www.facebook.com/
pcandtechauthority



Twitter

@pctechauthority

Get exclusive content with the **PC&TA iPad app**

If you prefer to enjoy PC & Tech Authority via your iPad (sorry, no Android...), then by all means please do so! Each issue is just \$6.49 and has all the content that you'll find in the magazine.

► **Get the app: PC & Tech Authority for iPad**

<http://tinyurl.com/IPADPCTA>



CONTENTS



52 MID-RANGE LAPTOPS

With a budget of \$1200 - \$2000 we rounded up a group of mainstream laptops and put them to the PCTA Labs test

60 CLOUD STORAGE

We can't imagine life without cloud storage these days. It's time to find the best of the best.



REGULARS

■ FEATURES

Is your job dead?

Will the cloud replace existing IT roles, as automated phone systems replaced operators? We find out..... **18**

Sharing too much

Letting your data leak online could expose you to hack attacks – or cost you your job. How you can stop oversharing..... **22**

■ TECHDESK

News..... **8**

Gaming news..... **10**

Chip News..... **12**

Most Wanted..... **14**

■ HOW TO

Double your Wi-Fi speed

Annoyed by a sluggish wireless connection? Discover how to fix it..... **87**

Six killer business apps

Tools you can't afford to be without..... **90**

Careers: UX architect

The ups and downs of a career in user-experience design..... **93**

■ FUTURES

Bitcoin latest

The Bitcoin technology that could change how we sign contracts, pay for taxis and even elect governments. **94**

Aluminium ion batteries

The new battery tech that could see you charge your smartphone battery in only one minute..... **97**

Amazon Dash

Amazon's plan to deliver household goods at – literally – the touch of a button..... **97**

■ REAL WORLD COMPUTING

Honeyball

With the addition of the stripped-down Spartan browser to Windows 10, is it a case of third time lucky for Microsoft? ... **100**

Ockenden

Media streaming..... **103**

Hume

Done right, CRM software can make a huge difference to a company – saving time, improving customer relationships and making more money..... **106**

Winder

While Facebook continues to allow shortened URLs, the best course of action to protect yourself from malware is to avoid clicking on unsolicited links..... **103**

Cassidy

Some technical decisions have very non-technical consequences – and are often based on little more than opinion..... **110**

■ ALIST AND KITLOG

The best of the best..... **80**

■ DVD CONTENTS

Your guide to this issue's free apps..... **98**

■ EPILOG

Jon Honeyball is sick of poorly performing Wi-Fi..... **114**

OVERSHARING

Social networking risks 22



REVIEW Office 2016 49



REVIEW Microsoft Surface 3 37

REGULARS

■ PCS & LAPTOPS

Dell XPS 13.....	56
Lenovo ThinkPad T550	57
Apple MacBook	54
Asus Zenbook UX305	55
MSI PE60-111AU	58
Toshiba P50W	59
HP Spectre 360	34
Intel Core vPro NUC.....	35
Acer Revo One	36
Microsoft Surface 3	37
Asus T300 Transformer Chi	39

■ HANDHELD

Huawei P8.....	46
D-Link Portable Digital TV Receiver.....	44
Mophie Juice Pack Air	45

■ PERIPHERALS

Viewsonic VP2780-4K.....	38
LG 34UC87 21:9 monitor.....	41
Belkin WeMo.....	42
Samsung T1 SSD	44
G Drive ev Raw	44
Sound Blaster E5.....	45
MSI Panocam.....	45

■ COMPONENTS

Supermicro GS50	45
-----------------------	----

■ GAMES

Project CARS	76
Wolfenstein: The Old Blood	78
Warhammer 40K: Regicide.....	79

■ WEARABLES

Microsoft Band	45
Bose QC 25	44

■ SOFTWARE

Adobe Lightroom.....	47
Ubuntu 15.04.....	48
Microsoft Office 2016 IT Pro and Developer	49
Box.....	67
OneDrive	68
Amazon Cloud Drive	70
Apple iCloud	70
Bitcasa Drive.....	71
Dropbox.....	71
Google Drive	72
Livedrive.....	72
Mozy	74
SugarSync	74

JOB DEAD

Will tech make you redundant? 18



RWC

Media streaming 103



FUTURES
What's next for Bitcoin? 94

SUBSCRIBE & SAVE!

Get PC & Tech Authority delivered!
For details on the latest subscription
off see page 80.



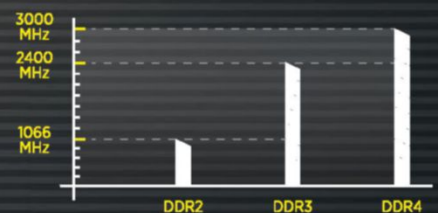
HOW TO
Faster Wi-Fi 87

The two reasons you need to upgrade your motherboard.



The DDR4 memory standard for Intel X99 Series motherboards is officially here, and it's officially awesome.

Corsair, the company that invented high-performance enthusiast memory, is taking the lead with all-new DDR4 versions of the legendary Dominator Platinum and Vengeance memory lines. Make the move to DDR4 memory with Corsair and you'll get dramatically faster speeds of over 3000MHz, larger capacities, and less power usage. It's the new memory spec that enthusiasts have been waiting for. So, the question is: what are YOU waiting for?



Learn lots more at corsair.com/DDR4



CHECK OUT THESE OTHER CORSAIR PRODUCTS DESIGNED TO MAKE YOUR PC THE BEST PC



MEMORY



POWER SUPPLIES



GAMING KEYBOARDS



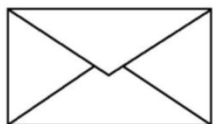
SOLID-STATE DRIVES



GAMING MICE



GAMING HEADSETS



INBOX

Topical thunder

LETTER OF THE MONTH UPDATE SHOCK

I have always read that automatic updates are recommended and should be left turned on. On a recent trip overseas I found that approximately 900 MB of data got used on updates and this can only be updates since I did very little web browsing apart from check Google email. Apart from the data usage the updates happen unexpectedly and freeze the computer at start up and shutdown.

While I appreciate the reasons behind the updates this is like buying a new car and changing the engine at every service. In case you are wondering, yes I did turn off automatic updates but it keeps turning itself back on on both my Win 7 and Win 8 laptops. And now with Windows 10 being a SAAS there will be no choice.

Something not often appreciated by software companies or even technical writers is the cost of data these days (while travelling) and slow internet connections.

S Patel

Ben Mansill replies: *It's a tricky one, alright. While turning off automatic updates before an OS trip for the device/s you're taking with you is one more thing to remember, balance that with the need to push important security updates out rapidly.*

BANDWIDTH BANDITS

Can I sue 'pushers' of advertising using my bandwidth? (I have just gone onto a website to get some information only to find advertising blasting me from my speaker.) At least I should have been warned BEFORE being so 'taxed' by stealing my bandwidth.

K Tietze

Ben Mansill replies: If only. I'd like to sue TV stations for all the cumulative months (years?) of my life wasted with commercial breaks. *Google 'Adblock'.*

BIOLOGY

I was an original subscriber to Atomic You can call me a computer enthusiast, my first PC was a Dick Smith System 80 with 4K RAM and there was no such thing as the internet back then, haven't we come a long way in 30+ years.

Recently I decided to upgrade my rig and because I love Asus and occasionally delve into the world of overclocking. So I bit the bullet, emptied my wallet and purchased an Asus ROG Maximus VII Formula with a 4790K CPU.

This is where my question comes in. I am self-taught by watching online videos, and nowadays to 'overclock', it's just a matter of pressing the 'CPU Level Up' button. Sometimes though, if you don't have a decent cooling system this will not do and you get the dreaded BSOD. This requires you to tweak settings in the UEFI or BIOS.

Does anyone know where you can do an online course that explains the hundreds of settings that the manufacturers put in there? There is only so much covered in YouTube videos, and if all you are meant to do is change the CPU ratio.

James Howden

Ben Mansill replies: *Understanding not only each mysteriously named BIOS setting can be a challenge, and tweaking them all for a stable yet high performance PC can be a small mountain to climb. Luckily the vast army of overclocking enthusiasts online stand ready, and a great many guides have been published, including one that James found covering his exact motherboard and CPU combo.*

INTEL VS AMD

I have always wondered why are eight cored AMD FX processors claimed to be worse than quad cored i5's. The speed in which core for the 8350 is higher, core count is higher, more cache. So how is a quad core i5 with less cache, lower core count and lower clock speed better, theoretically shouldn't the Fx be better?

Philip Dawson

Ben Mansill replies: *Firstly, many apps simply don't use multiple cores well or efficiently, so that immediately levels the playing field. Secondly AMD is unfortunately behind Intel in the efficiency of its microprocessor design. Intel cores are simply more able to churn through mainstream apps faster than the best from AMD at the moment.*

POWER USERS

Desktop computers are the dinosaurs of the digital age and I'm not sure that your fine magazine should be giving disproportionate coverage to the diminishing tribe of their owners.

Of course, minorities must be respected and given their due weight in your magazine. I am certainly not about to call any of your esteemed readers energy-sucking, greenhouse gas emitting vampires or anything of the sort.

But I wonder whether, if it is good enough to have energy star ratings on other domestic appliances, why they are not present on computers?

LOTM WINNER



This month's comment of the month will receive a PowerCube!

www.powercube-usa.com

WANT TO READ MORE?

Go to www.pcandtechauthority.com.au and join in the conversation. Also check out the Atomic forums: <http://forums.atomicmpc.com.au>

Want to get in touch?

MAIL: Inbox, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065

WEB: pcandtechauthority.com.au

EMAIL: inbox@pcandtechauthority.com.au
Please limit letters to 200 words, where possible. Letters may be edited for style and to a more suitable length.



TECH NEWS

The latest trends and products in the world of technology

PLANE SCARY: RESEARCHERS SPARK WI-FI HACKING ALERT

FBI warns airline staff to be on the lookout for anyone attacking in-flight Wi-Fi on planes – including security researchers

Nervous of flying? Then don't read this story. By the time you take your seat and have triple-checked that the belt works properly, it's likely that you'll have been X-rayed, frisked and forced to dispose of any liquids in excess of 100ml, all in the name of ensuring safety in the sky. Now there's another threat to fret over: in-flight Wi-Fi.

According to a report by the US Government Accountability Office (GAO), hackers could use onboard services to access the plane's main control network. It warned aviation authorities and airlines that passenger Wi-Fi could be used to attack certain models of planes, because they use the same network for passenger entertainment and connectivity as they do for key controls and avionics.

The GAO report cited four security experts who all agreed it would be possible for a passenger to bypass the firewall between the Wi-Fi and avionics systems, and thereby wreak havoc on a plane mid-flight. While this threat has long existed thanks to in-flight entertainment, which is also sometimes run on the same network as more vital systems, the risk is now heightened as passengers can connect their own devices to airborne Wi-Fi. Not only could hackers prepare and launch an attack from their device, but innocent passengers could inadvertently infect the system with malware when connecting their smartphone or laptop to the network.

AIRBORNE THREAT

It sounds like a movie plot, but the FBI believes it's a serious threat. While



admitting that it's seen nothing to prove it's possible to take over a plane via Wi-Fi or entertainment systems, the US policing agency and the Transportation Security Administration (TSA) warned airlines to actively look out for any network intrusions.

While security experts believe that such an attack remains unlikely, they noted that it's always possible to poke holes in networks. "Could a hacker bring down a plane from a mobile phone in seat 12C?" Sophos analyst Paul Ducklin asked. "That's very, very unlikely. Nevertheless, hats off to the GAO for adopting the computer security principle that we informally refer to as 'never say never.'"

Sean Sullivan, a security analyst for F-Secure, said it might be possible to hack avionics control systems that lack an "air gap" separating what should be two networks. "Modern avionics are 'fly-by-wire' systems – that is [they] use computers," he said. "The internal data bus that handles the fly-by-wire systems should be separate from other onboard systems. But this isn't always the case. In-flight entertainment systems should be separate, but this isn't always the case. Adding Wi-Fi systems to the mix just increases the potential number of access points to passengers in the cabin."

He said cars face similar challenges, with researchers having managed to access controls via entertainment systems, exploiting the DVD drives used to update navigation systems. "The systems

shared the same bus and so the car was hackable via a DVD," he added.

While the terrifying potential to bring down an airliner is likely to make many question the necessity of in-flight Wi-Fi, Sullivan said the threat could be mitigated if not removed simply by splitting up the network. "It's an argument for separate data buses and networks," he said. "But that would cost money."

HARD TO RESEARCH

While in-flight Wi-Fi is relatively new to most airlines, many have long had built-in entertainment systems that featured the same flaw. So why haven't security researchers been revealing such vulnerabilities sooner? Sullivan pointed out that the theory has been discussed for years in security circles, but physical tests are more challenging, as they require access to a plane. On the upside, that same hurdle makes it harder for hackers, too, as they also have limited opportunities to trial their attacks.

Sullivan said. "You can't really borrow a plane – and experimenting with one as a passenger... could end badly for the researcher."

Indeed, it already has for one researcher. Chris Roberts is the founder and CTO of security firm One World Labs, and avionics is his speciality. While on a flight to Syracuse, New York in mid-April, he read the GAO report and posted a comment on Twitter, remarking that he was able to connect to the plane's network from a port under the seat and "play" with critical in-flight systems, including the oxygen. The tweet ended with a smiley face.

Perhaps not surprisingly, various news agencies reported that Roberts was met by FBI agents on his arrival in Syracuse, and was detained for interrogation. His work laptop was held, and he's been banned from flying with that particular airline for the time being. While he didn't actually attempt to access the network connection point located under most airline seats, he's admitted to doing it before as part of his research.



< Chris Roberts found himself in hot water after tweeting about successfully hacking into the airline's network

WHAT IS...TIDAL

Famous names have backed the newest music-streaming service, but what makes Tidal different to the others? We find out whether you should tune in

Rapper Jay Z and his music-industry friends banded together at the end of last year to buy music-streaming firm Aspiro, rebranding its WIMP music player Tidal. Now the service has relaunched, with the stated goal of paying musicians more fairly for their songs.

JUST WHAT THE WORLD NEEDED: ANOTHER SPOTIFY RIP-OFF. Musicians might say that an initiative such as Tidal is long overdue. Spotify and other streaming services such as Rdio and Google Play Music have been criticised for not paying musicians enough for their wares, offering tiny percentages of pennies for each track played. Tidal is owned by artists, and reports suggest it will double the royalties offered by competitors.

SO, JAY Z. HE'S A... MUSICIAN? He's more of a businessman with a sideline in music. If you're not a fan of the rapper – or were wondering if his name was a typo – he's had support from the likes of Coldplay, Madonna and Taylor Swift, who recently pulled her music from Spotify saying the service wasn't beneficial for artists. That said, her most recent album 1989 hasn't yet landed on Tidal, so even she's hedging her bets.

HOW DOES TIDAL WORK? Positioned as a "luxury" music-streaming platform, Tidal offers 25 million tracks and 75,000 videos. It's supported on the desktop, on Apple, Android and network streamers,

and you can play selected tracks even if you're offline. That luxury comes at a cost, however: the standard version (Tidal Premium) costs US\$9.99 per month; Tidal HiFi, for lossless, 16-bit FLAC files is priced at US\$19.99 per month. You can try before you buy with the month-long free trial. Overall, Tidal is particularly expensive for Australians – Americans pay the same number of dollars – although \$10 per month seems to be the standard rate for streaming music these days, with Spotify offering its premium service at the very same price.

SO THE MAIN DIFFERENCE BETWEEN TIDAL AND ITS RIVALS IS THAT IT'S A MORE ARTIST-FRIENDLY BUSINESS MODEL? Aside from ownership, the big difference is supposedly sound quality. For the standard version, lossy AAC compression is used at bit rates between 96Kbits/sec and 320Kbits/sec. Upgrade to HiFi and the uncompressed files should give you, in principle, the same experience as listening to a CD. There's a downside to such high-quality streams, however: Tidal says its HiFi tracks will eat up 10MB of bandwidth per minute of content, versus 720KB/min for standard quality. So if you're out and about on your mobile connection, you may want to reduce the quality setting.

WHERE CAN WE TRY IT? Convinced by Jay Z and friends? Visit tidal.com/gb to try out Tidal free for a month.

HOT... OR NOT

HOT

MONITORS

So much happening! After a decade of nothing! 4K, FreeSync, G-Sync, 21:9 ultra wide screen, curved, experimental combinations of resolutions, aspect ratios and sizes... it's wonderful.



NOT

MECHANICAL KEYBOARDS

They're all good. There, collective group review written. The excitement of a new thing has dissipated, and disco pulsing full RGB keys are a stroke too far.



CORRECTION

In issue 209 of PC&TA we reviewed the Cougar 500K keyboard. The review criticised the split space bar and the inability to restore standard space bar functionality to it. While the documentation made no mention of this, it turns out that the accompanying software allows this. We apologise to Cougar and our readers for this error.



ASUS T300 CHI

We're awfully embarrassed, but yes, last month's review of the Asus T300 Chi was in fact of another product. The full T300 Chi review appears in this issue, on page 39.

NEWS BITES

1 SECURALIVE ENGINE SCORES LICENSE WINS

Last year Australian outfit PCRange launched its own homegrown security suite SecuraLive. Overseas interest has led to several other AV companies now licensing the engine SecuraLive has developed, in a testament to the product's effectiveness.

2 SURFACE 3 LANDS WITH FULL-FAT WINDOWS 8.1

Microsoft has ditched Windows RT for the full version of its operating system on its newest tablet, the Surface Pro 3. The tablet features a 10.8in, 1,920 x 1,280-resolution display and runs a 1.6GHz quad-core Atom. Our review is on page 37.

3 NOKIA TO RETURN TO PHONES IN 2016

The troubled firm sold its handset division to Microsoft in 2013, but reports indicate it could make a comeback. However, Nokia must wait out an embargo signed as part of the Microsoft buyout. More significantly, Nokia released a statement discounting these rumours. Watch this space.

GAMING NEWS

Alessandro Guarrera delivers gaming news' greatest hits

STEAM TAX UNVEILED IN NEW BUDGET

GST to add a 10% hike on select services

Federal Treasurer Joe Hockey recently unveiled the latest budget, revealing that the 'Netflix tax', a 10% GST increase, will receive a mandatory introduction to online sales from retailers yet to charge GST. The new tax is set to take effect on the first of July, 2017.

The Treasurer claimed the tax will be implemented to benefit local businesses who help "build our economy [and are] disadvantaged by the current system". Of cheaper online purchases taking customers away from in-store acquisitions. Hockey said this tax will see over \$350m raised and distributed through Australian states and territories.

While some digital distributors already

charge a GST, this tax affects a host of online companies, including Amazon, Netflix, and Steam. Combined with the unofficial 'Australia tax'; a price increase on goods sold in Australia, whose causes are nebulous when applied to digital goods and services, it seems Aussie players are once again getting the short end of the stick. We have seen several instances where this 'tax' is unfairly added to Australian consumers; Batman: Arkham Knight's premium edition costs an extra \$34.00 to Australian customers, compared to the equivalent US cost.

PC & Tech Authority's forums have not been silent. User "Afferbeck" said:

"With Steam we already pay more cos



Straya, then we pay even more because we get charged in USD for no reason, then we also have to pay the conversion fee, now we're also going to have to pay another 10% on top of that? PC game piracy has massively dropped in recent years but I wouldn't be surprised to see it has spiked in the past six months or so, and this tax isn't going to help."

It bears consideration that the government is essentially asking these foreign companies to raise the price of their wares, and pay the Australian government the revenue raised, which will all incur a time and staffing cost to implement and manage. So how will Steam, et al, pay for this effort? Possibly with an additional price increase...

QUICK SHOTS

News snippets to keep you on top of the game

ASSASSIN'S CREED SYNDICATE – VICTORIAN LONDON LIKE YOU'VE ALWAYS SEEN IT BEFORE

The ninth-entry in this long-running series of increasingly flamboyant Assassins and ever-easy combat has been announced. Syndicate will take place in Victorian London, a setting which feels as stale as the Queen's Scones, what with Dishonored, Thief, The Order 1886, recycling this setting with a verve that would make Captain Planet blush.



released this September. Helmed by God of War's Cory Barlog, the game looks like it will play as a combination of Rage and Shadow of Mordor.

THE WITCHER 3

In case you haven't noticed the ubiquitous advertisements, The Witcher 3: Wild Hunt, is out now. The game promises a large, dynamic open world, filled with quests both magical and mundane. Also touted, is CD Project Red's Witcher 3 DLC, much of which is released free with the game, with some held behind a season pass pay wall.

MAD MAX

With fewer Australian accents than you can poke a stick at, the upcoming Mad Max: Fury Road's tie-in game will be

TOM CLANCY'S 'THE DIVISION' DELAYED

Ubisoft revealed that The Division has slipped in its development, with the game set for a release in the first quarter of 2016. The fact that the company is currently touting the latest Assassin's Creed and Rainbow Six games makes it easy to assume that The Division has been delayed due to resources being allocated towards these more well-known franchises, it must be remembered that the 'Tom Clancy' brand is well established among gamers via Splinter Cell.

"SMALL STAFFING CHANGE" AT VISCERAL

EA games confirmed that Visceral games performed a "Small Staffing Change", i.e.; the company laid off an unspecified number of staff to allocate resources towards Battlefield Hardline: Premium, and an unnamed Star Wars project.

BLOODSTAINED WINS BIG ON KICKSTARTER

Industry veteran Koji Igarashi's Kickstarter campaign for Bloodstained is a resounding success. The Castlevania director created the campaign to show producers that his game would have an audience, only for the campaign to exceed over \$1.6m worth of pledges.

OCULUS RIFT COMING Q1 2016

Oculus has announced the final consumer version of the Rift will be released in the first quarter of next year. The Facebook-owned VR headset will be available for preorder later this year, with more details TBA.



ASUS All-in-One PC Series

Touch the beauty. Feel the power.

Powerful multi-function base
with NFC, wireless charger and
ASUS Ai Crosslink

10-point capacitive touchscreen
compatible with pencil and stylus pen

Innovative gesture control
Touch-free control of songs, videos,
photos, documents and more!

www.asus.com/au

*Reprinted from www.pcmag.com with permission. © 2014 Ziff Davis, Inc.
All Rights Reserved. *Multi-function base, touchscreen and subwoofer are optional.
Please check with reseller for more details.

Work easy. Play hard.  Windows

CHIP NEWS

Intel's socketed Broadwells soar high on air as **Mark Williams** sits ring side watching AMD ready two big launches

CPU

BROADWELL BREAKS FREE FROM BGA

Many didn't think we'd see the socketed Haswell refresh, Broadwell, come to market with Skylake mere months away, but it has started popping its head up with a nice surprise in tow. But first, some details.

The two CPUs that we know of are the i7-5775C and i5-5675C. The C designation normally reserved for embedded parts on these indicate that they have unlocked multipliers, enabling overclocking (as opposed to K, which we're used to seeing on Intel's unlocked processors).

These quad core 14nm parts both fall into a 65W TDP and with a BIOS update should drop straight into any current motherboard with a Z97 chipset.

The 5775C clocks in at 3.3GHz but can turbo to 3.7GHz including hyper threading, while the 5675C comes in at 3.1GHz with a turbo to 3.6GHz and no hyper threading.

Both include for the first time to socketed systems Intel's Iris Pro integrated graphics, with up to 128MB of eDRAM which could help Intel step on what toes AMD has left in the market.

The most surprising bit of news however is that someone has already gotten the 5775C to 5.0GHz with air

cooling alone! Far better than what could be achieved with even the enthusiasts' grade Haswell part, Intel's Devil's Canyon.

With such promising early results and a low TDP these look to be a tasty drop in upgrade for enthusiasts. These will be available from June 2nd.

AMD IS PUTTING THE GLOVES ON

AMD has been on the ropes for many years in the CPU department, haemorrhaging money every quarter and losing precious market share at every turn. AMD's Bulldozer architecture wasn't a success and has really been asked to box it out for a few rounds too many versus Intel's steady and reliable Core update cadence.

However AMD has been training, getting trim, taut and into the right head space to once again take the fight to heavyweight Intel.

Firstly they've trimmed the fat by cancelling the Skybridge project (the single socket that would support both x86 and ARM CPU types) partly because customers weren't showing much interest but also because AMD will be skipping the 20nm process node that the whole thing was reportedly based around. So rather than waste resources

refactoring for 14nm, the project has been axed.

AMD is getting into the right head space by announcing that the new ARM K12 project instead of launching alongside the new x86 Zen core next year has been pushed back to 2017 in favour of focusing on Zen and making sure that launch goes well.

AMD's Zen core architecture has been doing its exercises too, AMD has reported that they expect to see a whopping 40% or greater IPC improvement over the to-be-released Excavator cores.

Where 5-10% is the norm for CPU generational improvements, this'll be like five generations all at once.

Like the good old days, AMD will be focusing on releasing performance Zen FX parts first (no IGPs) before moving to APU and mobile solutions. They want to come out swinging for the heart and minds of customers.

But before we see all that, Bulldozer must be put through its final bouts. Godaveri, the Kaveri refresh has been put on a diet, sporting new Excavator cores with potentially 40% in power savings will be launching around Computex to help tide AMD over until it can start sprinting up the stairs Rocky style with Zen.

GPU

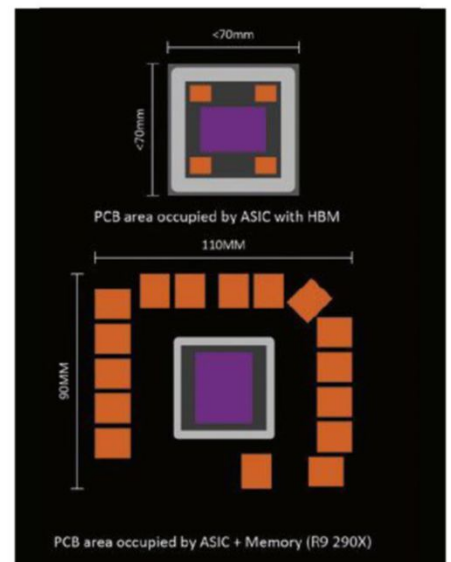
R9 300 SERIES LAUNCHING JUNE

AMD's long awaited product line-up refresh should finally be launching later this month on the 18th of June where most of the new 300 series line-up will be revealed at E3, and at a second event on the 24th the newly architected big daddy Fiji XT itself will be shown off.

Computer OEM's are already starting to build systems with 300 series graphics integrated into them. The only problem is that it appears as though everything from the R9 380 on down is just rebranded 200 series parts (Tonga, Pitcairn and Bonaire chips). For example the R9 285 will become the R9 380 and the R9 260 becomes the R9 360. Hawaii chips (found in the R9 290X) will also be rebranded,

but at the time of writing there's no word on what their new model numbers will be. The only saving grace for these reshaped parts is that they all should get some minor clock speed boosts on both the core and memory fronts.

The Fiji XT cards when they come will be the main event though and should prove to be surprisingly shorter in length than is normal for performance cards. With all the memory bundled up and stacked onto the GPU socket thanks to HBM, there's a considerable amount of PCB space that's no longer needed for GDDR5 memory chips. It could end up around the size of many high end R7 200 series cards, which means there'll be considerably more flexibility in a greater variety of system builds.



▲ Space savings of HBM vs GDDR5 memory layouts.



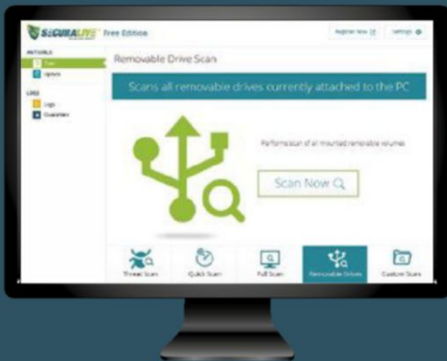
Australian Owned • World Class Protection

SecuraLive® Antivirus

Antivirus | Antispam | Anti Malware



The Ultimate Protection
100% ITW Virus Detection with Zero False Positives.



SecuraLive® also specializes in:

- ✓ Antivirus
- ✓ Mobile Security
- ✓ Internet Security
- ✓ Ultimate Security
- ✓ Internet Gateway VPN
- ✓ PC Booster

OEM / SDK / API & Re-brand / Co-brand / White Label opportunities available.

SecuraLive® Antivirus

**FREE
DOWNLOAD**

visit www.securalive.com

✓ FREE VERSION

- World Class detection engine
- Code Emulations
- Scans and cleans your computer thoroughly
- Minimal resource utilization
- Lightning quick performance

GET PROTECTED!



PRO Version

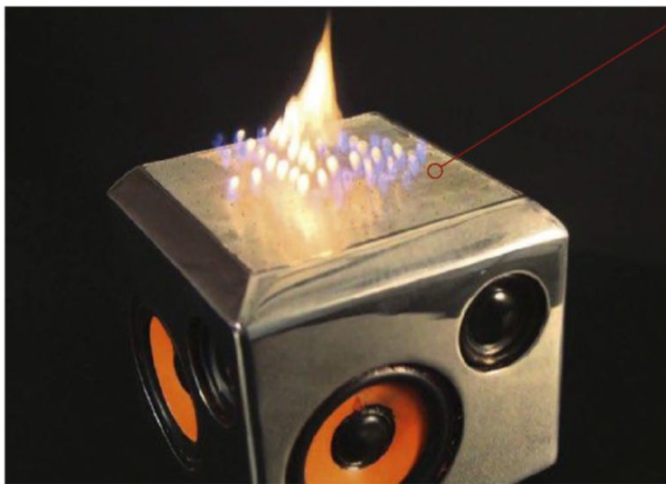
All the benefits of the free version plus the following:

- Proactively identifies previously unknown malware in real time
- Http Scanner
- Infected objects can be quarantined before any action is taken
- Evacuates all hints of viruses, spyware & malware
- Data loss protection

For more information regarding SecuraLive® Antivirus please contact us on **1800 201 202**, sales@securalive.com or visit our website at www.securalive.com. Securalive® is a registered trademark.

MOST WANTED

Bits and bobs we find interesting. By **Rob North**



The Sound Torch

While there's a whole heap of super flashy, aesthetically pleasing and ultimately overpriced Bluetooth-enabled portable already speakers on the market, The Sound Torch looks set to be the red hot ostentatious choice for consumers when it heads to Kickstarter soon, with only 100 available for the early bird backers. Why red hot, you say? Well, because it's topped with an inbuilt gas-powered pyro board that visualises your music as it's playing with a real open flame, that's why. What could possibly go wrong, am I right?

MOST WANTED: The obligatory sessions spent huddled in dark rooms mesmerised by the dancing pyrotechnic display as the speaker pumps out various songs with fire or flame in the title.

NOT WANTED: When you get so sick of hearing 'We Didn't Start the Fire' by Billie Joel, and realising you've done little more than burn a sizeable hole in your pocket by backing this bad-boy.

LilyCamera

The Lily Camera is a compact and lightweight self-flying camera drone. You simply toss the drone into the air and let it trail after you and record as it tracks a small remote on your body.

MOST WANTED: The Lily Camera records in 1080p at 60fps, and also features accelerometers in both the drone and remote which will automatically kick it into a 720p slow-mo mode and fire off a burst of stills when you suddenly change motion, for example, as you jump. There's also a microphone cleverly situated in the remote so it will pick up the sound around you rather than the grating sound of the drone's rotors.

MOST UNWANTED: Unfortunately, there's no collision-avoidance system yet, so shooting anywhere other than in an open field or clearing will be problematic.



Nexpaq

Capturing the support of the Kickstarter community, Nexpaq is a smartphone case for iPhone 6, Samsung Galaxy S6 Edge and Galaxy S5 with space to add and remove physical modules from the back of the case that provide additional features beyond the native phone software and hardware.

MOST WANTED: The modular design means you can swap in and out the modules you need as you need them; amongst them the Breathalyzer, SD card reader and Amplified Speaker seem the most useful for the everyman.

NOT WANTED: We can already picture the smarmy attitude of the boring Tony Stark/Bruce Wayne wannabes who'll waste precious moments of your time assessing the 'Temperature and Humidity' and the 'Air Quality' before showing you the superiority of their 'Super LED flashlight

XFORMA MBX MKII

We all know that putting together a high-end PC can be a costly exercise, but have you ever heard of someone paying more for their case than the rig itself? Enter the XFORMA MBX MKII.

MOST WANTED: If you can afford to splash out and aren't interested in building a custom case the MBX MKII is an outstanding out-of-the-box design. It can easily be stripped down to the chassis and reassembled, with solid aluminium motherboard tray and modular sections for SSDs or HDDs, custom made printed circuit boards and integrated cable management systems.

MOST UNWANTED: Contrarily, this over engineered monstrosity (albeit a beautiful beast) which was originally aptly titled the Murderbox will set you back US\$1250 for the base model alone. Purchasing it will, needless to say, kill your wallet.



Gell DDR4 Super Luce

Keenly aware that custom builds are as much about aesthetics as they are about performance and affordability, Taiwanese DRAM specialists Gell's new Super Luce range of kits come equipped with LEDs (in white, red or blue) that pulsate at varying frequencies to indicate their temperature.

MOST WANTED: It's always nice to see a bit of hardware that talks back. The inbuilt thermal sensor prompts the coloured LEDs to pulsate more frequently as your system gets hotter, offering a nice bit of visual feedback for anyone overclocking their memory.

NOT WANTED: While I can't wait to see the Super Luce LEDs operating under low light, I'm willing to bet the aesthetic benefits will wane over time as you either grow accustomed or distracted.

Australia Post Apple Watch App

Australia Post has been doing its best over the past few years to keep up with the times and remain profitable despite the suitably slow death of snail mail, and their latest effort promises more convenient options for keeping track of the one type of mail we can't receive over the internet: parcels.

MOST WANTED: The app allows you to track, schedule or redirect deliveries and receive notifications when you have something to collect. The app will also let you scan your wearable tech to receive parcels at post offices and secure parcel locker locations.

NOT WANTED: While I look forward to tracking my deliveries as they slowly make their way through mail sorting rooms and inexplicably halt at various stages of the process, do I really want or need to do this from my smartwatch rather than my phone?



FlatVR

What was your greatest achievement during your high school years? Unless your name happens to be Ethan Bloom, we're going to guess it probably wasn't designing, manufacturing the prototype and launching a Kickstarter campaign for a cheap and portable VR headset that works with almost every smartphone.

MOST WANTED: FlatVR is completely portable, breaking down into six pieces weighing only 90 grams in total and packing down flat just over an inch thick. It straps onto almost all smartphones, and Ethan had the forethought to work with opticians to gauge both the generic width of frames and the distance between the central points of the eyes so that it can be worn with glasses, solving an oft-experienced problem for bespectacled VR fans.

NOT WANTED: Unfortunately at the time of writing Ethan's Kickstarter campaign wasn't on track to reach its \$15,000 goal, the amount needed to purchase the metal mold needed to manufacture the product en masse, but here's hoping for a last-minute influx of backers!



SHOULD I BUY FROM OVERSEAS?

Anthony Caruana on the pros and cons of chasing a clever discount

One of the constant refrains we hear from readers is the way manufacturers and local retailers and distributors jack up local prices on items for, seemingly, no good reason. We've had a few letters on this, so, rather than address each one separately, we thought we'd tackle them collectively.

In a globalised economy, you'd expect pricing to be reasonably even across different jurisdictions once you allow for exchange rates. For example, based on current rates, you'd expect something that costs US\$100 to cost about AU\$125. However, that is not always the case.

Some of this has been brought to sharp attention with the recent federal budget and the so-called "Netflix Tax". This new enforcement of the GST rules will mean that goods and services sold in Australia to Australian consumers will attract GST regardless of where the financial exchange occurs.

In other words, if you buy a service from an overseas company, you can expect GST to be slapped onto the transaction. For individuals, this means the prices of some services will go up by 10%. For businesses, it's less of an impost assuming they are registered for GST and the claim the GST back when they carry out their monthly or quarterly BAS submission.

When large companies set pricing in overseas

jurisdictions they build some margin into their pricing to compensate for expected currency fluctuations. So, there's a little bit of "fat" in some prices to cover this.

There's a lot more to local pricing than simply applying an exchange rate. For the purpose of illustration, we're going to compare the Australian, US and UK pricing of a MacBook with 512GB of storage. The reason we've chosen this model is that Apple sells the same unit to all countries. Many other manufacturers either localise equipment or sell different versions of the same product through different retailers with minor differences. So, making a direct apples to apples comparison can be hard.

Choosing an Apple product makes it easy to do a comparison.

Based on current pricing:

- In the UK it costs £1299. That's \$1838 when we do a currency conversion with current rates.
- In the US it costs US\$1599. That's \$2000 when we do a currency conversion with current rates.
- In Australia it costs \$2199.



Anthony Caruana has worked for almost every major masthead in the Australian IT press. As an experienced IT professional – having worked as the lead IT executive in several businesses, he brings a unique insight to his reporting of IT for both businesses and consumers.

US PRICING

The problem with the quoted US pricing is it lacks local taxes. If you bought the MacBook in New Hampshire, you'd pay the sticker price as there's no state sales taxes. However, cross the border into New York and you can add a 7% state tax, 3% county tax and then, potentially, city taxes depending on where in

"You'd expect pricing to be reasonably even across different jurisdictions"

the state you make the purchase.

Suddenly, the \$200 "discount" from buying when overseas disappears. In some cases, you can end up paying as much as 14% more than the sticker price.

UK PRICING

In the UK, VAT, or Value Added Tax, is added to the price of all electronics. The rate is 20%.

Apple's prices include VAT so that \$1838 represents a real saving on our local prices.

What if you're travelling? It might be tempting, if you're heading overseas, to hold off on purchasing your new gear until you've left the country. However, that might not be the best deal.

If you buy your item in Australia and take it overseas, you can take advantage of the Tourist Refund Scheme or TRS. Although it was created for tourists, locals can also use it. The TRS provides a full GST refund issued at any Australian international airport.

The rules are simple. As long as the item cost more than \$300, was purchased within 60 days of departure, you have the invoice and can carry it in your hand luggage, you can claim the GST back.

In our observation, this is often better value than purchasing duty-free at the airport.

So, if you're going overseas, that \$2199 MacBook is suddenly just \$2000.

The other gotcha if you plan to buy your electronics while overseas, to take advantage of better exchange rates and lower prices is credit card fees for overseas transactions.

Most credit card companies charge a commission of foreign currency purchases. All it takes is an unexpected commission and slight fluctuation in the exchange rate for your bargain to become way less attractive.

NEED HELP? EVER HAD AN ISSUE AS A CONSUMER? INVESTIGATOR CAN HELP.

If you've had an issue or had something happen and you think investigator could help, email your problem to investigator@pcandtechauthority.com.au



GAME ON DEMAND

THUNDER K7 MECHANICAL KEYBOARD + MACRO KEYPAD

THUNDER M7 MMO GAMING MOUSE



World's 1st
mechanical
gaming keyboard
with detachable
macro keys

Superior
CHERRY MX
mechanical
key-switch

Absolute
anti-ghosting
multi-key press
capability

AORUS
Macro Engine



16 fully -
programmable
gaming buttons

Fine-tuned
ergonomics for
MMORPG game
titles

Advanced
8200dpi laser
sensor

Ultra-durable
20 million clicks
Omron switch

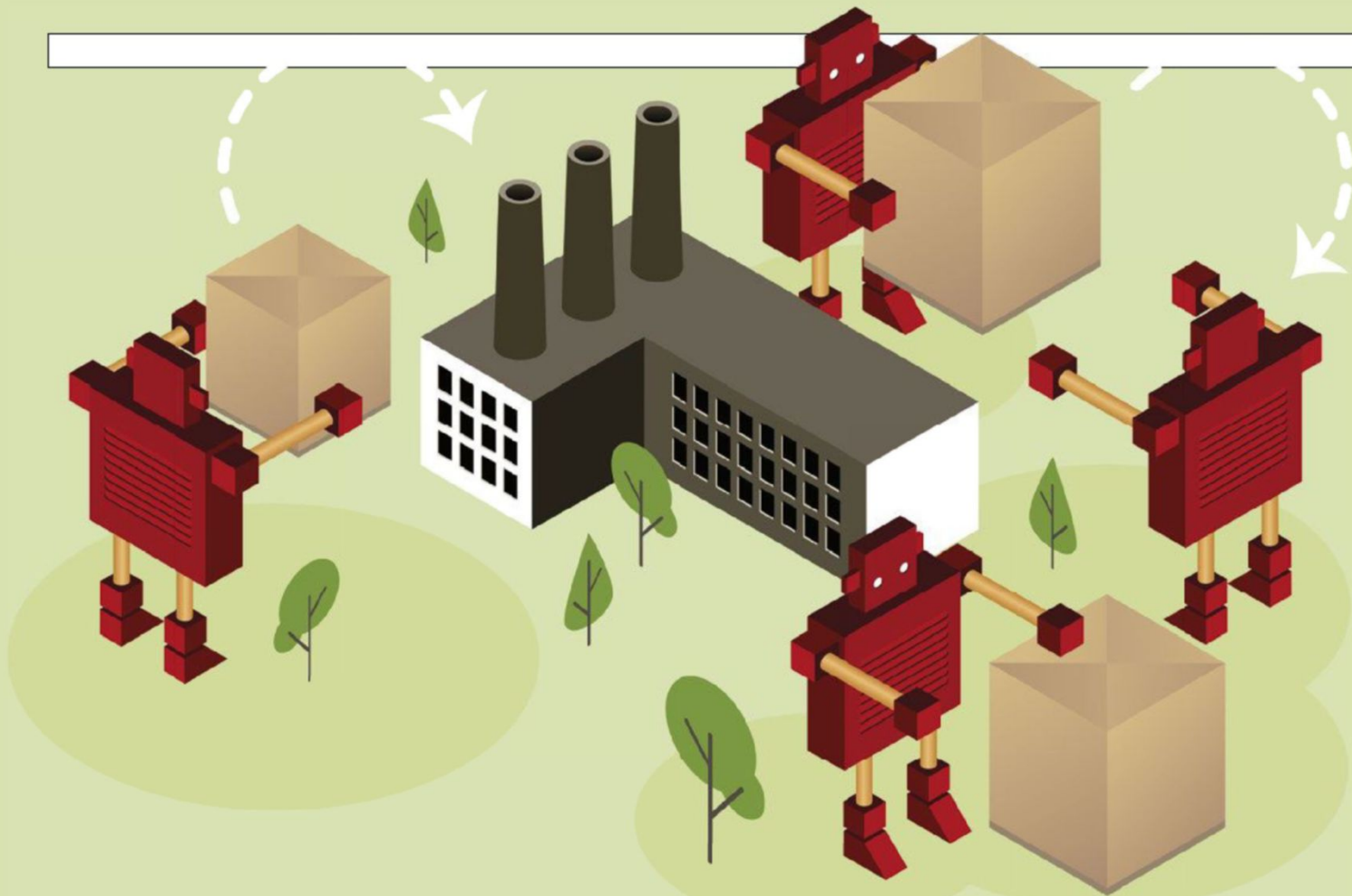


reddot design award
winner 2015



www.aorus.com

The entire materials provided herein are for reference only. AORUS reserves the right to modify or revise the content at anytime without prior notice.



Is your job dead?

WILL THE CLOUD REPLACE EXISTING IT ROLES JUST AS AUTOMATED PHONE SYSTEMS REPLACED OPERATORS? **SIMON BREW** INVESTIGATES WHETHER THE LONG LIST OF VIRTUAL THREATS COULD HAVE A REAL IMPACT

There's a chance that you haven't heard of a firm called NCR. There's no reason why you should have, apart from the fact that it's a worldwide organisation, with an Australian presence – and one that you've more than likely interacted with this week.

Or, to be more precise, you've interacted with one of the 100,000 self-service kiosk terminals that it has so far installed around the world. The company estimates that those terminals are responsible for processing around 14 million transactions a day – transactions that used to be

processed by human beings.

NCR boasts self-service kiosks in supermarkets, cinemas, petrol stations, stadiums and airports. "Don't add cashiers when you have peak levels of traffic," it urges. "Self-service kiosks can fully replace cashiers, saving thousands of pounds every year." They have done. It's hard to find a supermarket that doesn't now have a row of self-service kiosks where human checkout operators used to sit. This is the most visible sign of what's happening; from credit card slots in petrol pumps to airline apps that let you check in from a

smartphone, technology is fast enabling automation. And in the process, it's destroying jobs.

As Oxford University's Dr Carl Benedikt Frey predicted in his 2013 paper, *The Future Of Employment* (tinyurl.com/oj67kae), "about 47% of total US employment is at risk" from computerisation.

CREATING YOUR DEMISE

So, is your job dead? If you work in the IT department, it may well be time to update that CV. Go back only ten years and the role of the standard office IT department

was, on paper at least, simpler. Day-to-day concerns tended to centre on maintaining email and backups, network management and on-site support. Plus keeping the printer motoring, of course. While that may still be the case in some businesses, we're increasingly seeing a migration towards cloud services. And not only with services such as email: it's infrastructure too. No-one takes the backup hard drives home with them every night any more. "Technology will remove jobs. It has to," Mark Evans, head of IT at global property and construction firm Rider Levitt Bucknall (RLB), told us. "In IT, we've had a 'free ride' for a long, long time and - for businesses to compete - overheads must be controlled and, eventually, curtailed." Not that Evans has, in his words, "a death wish for the industry that's provided me with a living wage". He simply believes that the current situation is untenable.

"I'm so frustrated by my peers, who see head count as an indication of how successful they are. Use the technology to drive down IT head count, make a return to the business, bring down costs, underpin the viability of your employer - even if it begins to make your position precarious," he implores.

Along with many experts, he argues that we're reaching a point where IT jobs can almost entirely be outsourced. The advent of consumable-style cloud services has brought us to a point where small- and medium-sized businesses can, in Evans' words, "just pay for what you use to provide IT services to your business, in the same way that small firms hook up to electricity in the office to run the photocopier and the coffee machine".

"Very few people consider the infrastructure behind power," argued Evans, "and why should they?"

Even very small businesses are seeing the advantage of a Google Drive account or a Dropbox service. That, in turn, offers just

a glimpse of the other services available. Goldman Sachs predicts that, between 2013 and 2018, businesses will spend 30% more on cloud infrastructure each year. One suspects that this is money spent on services rather than internal staff.

The change is happening, and in many organisations it's already happened. Fewer and fewer smaller businesses need an IT department, and where the IT director or IT manager would once have directly overseen a company's physical technology infrastructure, now it's increasingly about managing external services and contracts.

"The IT director is effectively creating their own demise by bringing in a service that will ultimately require very little involvement by IT practitioners," Evans effectively argues.

THE MORE THINGS CHANGE...

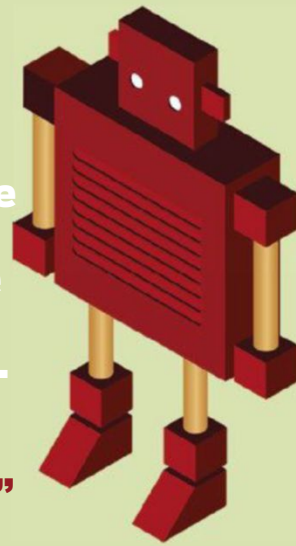
Yet while the clothes have changed, hasn't this always been so? Hasn't automation and technology come along, unsettled people, and brought in predictions of mass unemployment, with the furore then dying down once it's clear those predictions won't come true?

In the 1950s and 1960s, clerical roles were under threat from typesetting machines. In the 1970s and 1980s, robotic automation threatened jobs on car-assembly lines. Then, more recently, the growth in online shopping threatened to obliterate the bricks-and-mortar stores.

It would be wrong to say that these advances didn't each have an impact; in particular, the migration from a manufacturing to a service economy has been pronounced. After all, technological advances don't discriminate: from the IT department through to the hotel check-in desk, technology continues to take over roles that human beings used to be paid for.

So why, then, hasn't the result of this been a steadfast decline in the number of jobs? Peter Cochrane, an engineer,

"We no longer have bell boys, telephone or telex operators. We do all that ourselves"



technologist and entrepreneur - and the former CTO of BT - told us that he believes "historically, technology has created more new jobs than it has destroyed".

So we need technology specialists - but slightly different specialists to the ones it had before. "We have vacancies for software analysts, writers and games producers. There's an endless list of vacancies that aren't being filled."

Appreciating that not every IT skill is transferable, there certainly seems to be no shortage of demand for technical, skilled work. What's changing is the make-up of the work itself, and also where it's being demanded geographically.

"The big problem is that we don't seem to be good at managing this," Cochrane argued. "Our education system continues to educate people for jobs that don't exist."

HOME ECONOMICS

Threats remain. Gartner has predicted that one in three workers will be replaced by a drone or robot by 2025. Going back to the figure cited by Dr Frey (accepting that his study focused on 702 detailed occupations), up to 47% of jobs might be affected. If

AI VS BANKERS

The progression in artificial-intelligence technologies is perhaps the biggest threat to traditional jobs as we know them. Investment bankers, for one, are firmly in the firing line, argues Peter Cochrane, former CTO of BT.

"AI has outsmarted human beings now at general knowledge, and specific knowledge, such as medical diagnoses. It's only a question of time before it moves into areas such as banking."

How soon does he predict that this will happen? "I'd say investment banks will be taken out by artificial intelligence, and we'll see the impact within the next decade. My forecasts are usually cautious, though..."

✓ For every automated check-in terminal, there will be someone who needs to support it



✓ This could increasingly become a rare site as kiosks expand in terminals around the world



“In the chain, someone has to design the software, put together the unit itself, and deliver it”

either number quoted by Gartner or Frey proves accurate, it spells potential disaster for all affected economies. At least, that's if everyone in the affected roles heads to the unemployment line.

So the bigger question is whether more jobs are being lost than being created. On the surface, it seems so. Common sense dictates that if you have 20 check-in kiosks at an airport where people used to sit, then at least some people aren't employed as a consequence of that.

Yet what about the jobs created elsewhere? For every kiosk, there's somebody who needs to support it, to install and maintain it. There's a sales force, admin and accounting staff. Even an organisation deploying a kiosk knows it has to have a human being on hand for when something inevitably goes wrong.

Going back further still in the chain, someone has to design the software, put together the unit itself, and deliver it. Plus, there will be a constant battle to upgrade it, to make it more user-friendly as people's



▲ Every supermarket chain has now introduced self-service checkouts

expectations change. Certainly, self-service kiosk manufacturer NCR has a long list of job vacancies on its website.

In the words of Cochrane, “we no longer have bell boys, for instance. We no longer have telephone or telex operators. We do all that ourselves. As a result, we become empowered, and we can do more work, live richer lives, and the networked world can employ more people than ever before.”

DON'T GIVE UP YET

As both history and common sense point out, then, economies need jobs. Governments need people to be employed. Furthermore, the more expertise a job requires, the more – in theory – it holds value to a country's economy.

It's hard to think of too many capitalist governments that wouldn't intervene were they to face a pronounced employment crisis in the face of sizeable job threats and also potential brain drains.

So much for the big picture. The core



DRONE ALONE

As fascinating as drone technology is, Amazon's plans to deploy them to deliver parcels to customers was greeted with scepticism. The firm has been openly testing the technology since December 2013, with its so-called Octocopters supposedly set to become a commercial reality in 2018.

Will they eradicate jobs? While there would be a lesser demand on postal services, the back-end support, technology and management – not least in the early days of drone deliveries – are likely to create as many roles as are lost.

Let's not forget, too, all the lawyers that will be kept in work when the first drone flies into someone's house by accident...

question remains: is your job dead? The answer remains: possibly. It depends on the job. Certainly, the demand is for a different set of specialisms than ten years ago. A decade from now it will change again; yours may be among them, it may not.

This is both the beauty and horror of the IT: it drives constant change. So, if you're part of this amazing industry that insists on eating itself, maybe it's time to check that you have some searchable skills on LinkedIn. ●

5 jobs that didn't exist ten years ago

Let's not focus only on the jobs that are disappearing. Here are a handful of roles that you can apply for today that didn't exist as little as a decade ago

BIG DATA ANALYST

A consequence of the sheer wealth of information generated on a daily basis is that it takes a specialist to pore through it, and to get a picture of customer habits, for instance. That's where a Big Data analyst comes in.

SAAS-RELATED ROLES

Leasing software in itself is nothing new, but the mass-market take-up of subscription software options has ignited in recent years. Consequently, businesses are springing up around software-as-a-service, from business

development through to development work.

USER-EXPERIENCE DESIGNER

You can't have a successful app if you haven't thought carefully about how the user will interact with it, but UX – as it's often shortened to – stretches into the real world, too. For instance, the trick to having a self-service kiosk is to ensure as little human involvement as possible, aside from the customer. User-interface design is a fast-growing discipline, with increasing options for academic study too.

REPUTATION-MANAGEMENT CONSULTANT

Jon Ronson's latest book, *So You've Been Publicly Shamed*, shines light on the little-

known world of reputation management. Reputation-management consultants offer guidance to people who fear what will be revealed when their name is entered into Google, and in turn work with them to bury negative results as deeply as possible.

SOCIAL MEDIA MANAGER

An increasingly lucrative business, as companies invest more and more in managing their social media presence. What does a social media manager do? It varies from role to role and varies often by organisation, too, but their central task is to ensure that their brand's values are reflected across platforms such as Twitter and Facebook, and that they have the right sort of presence on emerging alternatives.

LINKSYS



EVERYBODY'S ONLINE. NOBODY'S WAITING.

The latest in router technology has arrived. The new **Linksys EA8500 Max-Stream AC2600 MU-MIMO Router** is the ultimate solution for multi-device households. Our advanced MU-MIMO technology delivers 3x* faster Wi-Fi speeds to everyone on your busy network.

Now the whole family can share the network without buffering, enjoy online gaming without lag and stream movies without frozen screens. You can also remotely access your network using **Smart Wi-Fi** on your desktop or device.

- Multi-User MIMO technology
- 1.4 GHz dual-core processor
- 4x4 Wireless-AC delivers 4 streams of data
- 4 adjustable antennas
- Simultaneous dual-band (2.4 GHz and 5 GHz)
- Beamforming Technology
- USB 3.0 Port
- Combination eSATA/USB 2.0 Port

*Three or more 1x1 MU-MIMO-enabled client devices must be connected to achieve the three (3) times faster physical data rate.



linksys.com.au

@LinksysANZ

You are sharing TOO MUCH

LETTING YOUR DATA LEAK ONLINE COULD EXPOSE YOU
TO HACK ATTACKS - AND EVEN COST YOU YOUR JOB.
NICOLE KOBIE FINDS OUT HOW TO STOP OVERSHARING





A tweet in the morning to share a link. A few photos on Facebook after a holiday. A snap on Instagram to show off a particularly tasty lunch. We broadcast the little details of our lives online without a second thought – but should we really be so cavalier?

Sharing information online can carry numerous risks. Mention the fact that it's your 40th birthday and the whole world now knows your date of birth – and that could be enough to enable a hacker to impersonate you online. A holiday snap could reveal to burglars that you're away from home, and a poorly worded status update could cost you your job.

Such dire consequences may seem unlikely, but they've all happened to real people. In this feature, we'll show you how to avoid becoming the next victim. We'll look at the risks of oversharing online, and see how you can audit and clean up the data that's already out there. We'll also guide you through Facebook's privacy settings – so you can ensure that, in the future, your personal data stays personal.

HORROR STORIES

We all have moments when we blurt out the wrong thing in front of people; now imagine doing it in writing, for everyone to see. Facebook, Twitter and other social media hangouts make that very easy to do, and although most of us experience nothing more than a few mocking responses when our judgement momentarily fails us, some have suffered far harsher consequences. For example, pity the staff at a major hospital, who in a moment of boredom jokingly posted photos online of themselves lying down on the job – they were promptly suspended. Or waitress Ashley Johnson from North Carolina, who lost her job after posting

complaints online about poor tips.

With such examples to learn from, why do so many of us share as much as we do? Dr Jennifer Golbeck, director of the Human-Computer Interaction Lab at the University of Maryland, suggests that the online world doesn't seem real enough for us to appreciate the dangers. "The lesson we've learned, as we've watched privacy become an issue on social media, is that people really don't understand the impact of what can happen from sharing something – until they have some personal experience of the consequences," she said.

Indeed, we're actually wired to share. A 2012 study by Diana Tamir and Jason Mitchell of Harvard University found that sharing personal thoughts triggers the release of dopamine, meaning your brain rewards you for doing it. So, as Dr Golbeck pointed out, the phenomenon isn't a new development at all: "Online technology just made it possible for us to share with more people over a greater distance than they could before," she said. "We want to make social connections with people and feel validated, and this is just one way of doing that."

ACCIDENTAL SHARES

While sharing is a natural instinct, social media makes it easy to share more widely than we actually intend. "Certainly there are some cases of people who are naive, thinking that their post won't be shared," Golbeck said. "Or, it's technically unclear what can happen."

That's no accident: shared information is the lifeblood of social media sites. Facebook in particular makes you feel as though a small number of people are seeing your posts, when in fact many more may catch sight of them – even if you've limited your posts to friends.

"You may have 400 friends on Facebook, but there are only 20 to 30 of them actively posting stuff every day," Dr Golbeck pointed out. "Seeing information from a pretty small group of people gives you the idea that it's only that group of people who is seeing what you post. In fact, the audience is usually much bigger."

Part of the problem is complicated settings. Facebook is infamous for frequently changing its privacy rules and settings, making it difficult to keep up with (see Update your privacy settings in Facebook, p28). Dr Golbeck points to Mark Zuckerberg's sister, who publicly posted a family photo

“Social media makes it easy to share more widely than we actually intend”

she thought was private. Because someone else was tagged in the image, it spread and quickly leaked into the public eye. "Even some of the Zuckerbogs don't know how to deal with privacy on Facebook; they don't technically understand it," she said.

Indeed, Dr Golbeck herself, whose work has focused on privacy and social media since the days of Myspace, still gets caught out. She pointed to a website called takethislollipop.com: give it permission to see your Facebook page, and it puts together a genuinely creepy video of a stalker poring over information culled from your profile. Golbeck didn't think it would find any information on her – and was taken aback when she realised how much it was actually able to access. "I tell this story," she said, "because if I can't figure this out, when it's my job to be an expert on this, no-one in the world could be expected to figure this out."

CAREFUL WHAT YOU WRITE

Oversharing online has become such a problem that there's now a whole industry dedicated to cleaning up people's mistakes. Asked whether it's a busy line of work, Simon Wadsworth, head of reputation-management firm Igniye, simply laughs. While such services have traditionally been used by businesses seeking to boost their brands, 40% of his firm's clients are now individuals, from high-level executives being targeted by angry ex-employees to everyday people seeking to escape an unfortunate online history.

"For individuals, it's less about social media, and more about how they're perceived when someone Googles them,"





Wadsworth explained. "Whether it's a recruiting officer at a company or someone accepting graduates into a university, the first thing they'll do is Google you. The traditional CV isn't dead, but it now comes second to Google."

Dr Golbeck's students frequently air the view that this isn't a fair way to assess someone's personality. "On one hand that's true," she noted. "I think we've evolved to the point where people are a little bit forgiving of traces of teenage life online."

However, some people's jobs require them to be unforgiving, as Dave King, CEO of reputation-management specialists Digitalis, pointed out. "If we're asked by a law firm to look into an individual in a criminal case, we'll be digging for as much content as we can."

OVERSHARING SECURITY

Oversharing online isn't only potentially embarrassing or career-limiting - it could also be dangerous, noted Chester Wisniewski, senior security adviser at Sophos. "We might think that sharing personal data online just means we can be stalked or spied upon, but sharing too much information online can also make identity theft, tax fraud and social engineering significantly easier," he told *PC & Tech Authority*.

The riskiest information to divulge on the web varies by individual, but Wisniewski pointed out that some items are sensitive to almost everyone. These include your postcode, date of birth, national insurance number and other unique identifiers - such

as your mother's maiden name. "Much insecurity comes from the old world colliding with the new world," he noted. "Information that we wouldn't have shared widely before the internet is still being used to verify our identities."

It may seem unlikely that you could become the target of a hacker based on such inane details, but it happened to former US vice presidential candidate

"Criminals are using social media to work out when a target is on holiday"

Sarah Palin, whose email address was compromised during the election campaign. "The password-reset question asked which high school she had attended, and this information was in her Wikipedia entry," Wisniewski said.

You don't have to be famous - or infamous - to be a target. "The biggest [attack] we have seen of late involves fraudulent tax filings in the United States," Wisniewski noted. "A few key details about an individual can provide enough information for a crook to impersonate you and claim money."

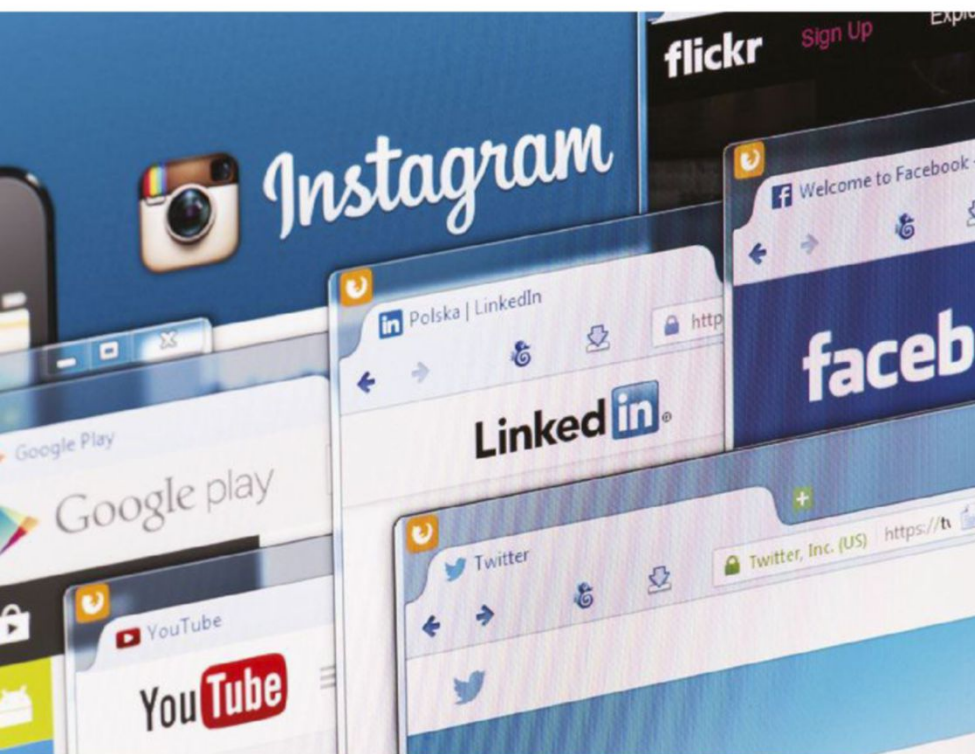
King revealed that his company, Digitalis,

looks after the online outputs of several heads of state, international royal families and FTSE CEOs. Part of that job is to minimise the risk of burglary when high-profile clients are away from their expensively kitted-out homes, and to ensure the children of famous parents aren't put at risk of kidnapping by tweets that reveal their whereabouts.

"For the normal person on the street, the same rules apply," King said. "Increasingly, criminals are using social media, even if it's just to work out when a target is on holiday - to work out when to break into their home or steal their car."

"Location is a big thing," he added. "As soon as you tweet that you're enjoying a day out at the Taj Mahal, I know you're not in the country. With public information on the web, I can probably find out where your house is, as well as whether you have a mortgage, what kind of car you drive and so on. People so often put up pictures or notes about their travel, and that's one of the biggest risks."

Keri McMullen from Indiana found that out the hard way. After she had posted on Facebook that she was off to see a band, a childhood-friend-turned-burglar checked to see what time the show started, and broke into her home knowing that it would be empty. In New Hampshire, a gang robbed at least 18 properties after using Facebook to discover who was away from their home. It isn't only Facebook, of course: services such as Twitter and



Foursquare may present even more of a danger, since your tweets are visible to all, while Foursquare confirms your location. The website pleaserobme.com checks these services to find out whether you've shared information that would be of use to burglars.

CLEANING UP YOUR ONLINE PROFILE

If you're concerned that there might be too much personal information about you in the public domain, the first thing to do is check. That's right: Google yourself. And don't stop with your name; also search for your email addresses, alternative usernames and images. Take a profile photo from Facebook or Twitter, and drag it into the search box on Google's Image Search page. This will show you any other websites using that image. "This is an easy way to discover whether something you once posted through Facebook became public," Dr Golbeck pointed out.

If you do come across something that you want removed, you can often log in to the hosting service and delete it yourself - after all, in many cases you were the one who posted it. If that option isn't available, you can ask the host to remove it - but this isn't necessarily easy to do. And when it comes to overseas companies, there's little you can do except ask nicely.

European residents can take advantage of the EU's unique "right to be forgotten", which lets you get outdated information removed from web search results. To make a request, you simply need to enter the details at tinyurl.com/pu8mhko - although Google

isn't obliged to honour requests if it considers the information to be in the public interest.

"The type of clients we have, when they make the applications, aren't generally successful," noted Simon Wadsworth. "The clients will always insist that we try it, with good reason, but Google will hide behind the public-interest angle. To the majority of requests we make, Google just says no."

Dave King agreed, noting that even if Google does remove the link, it doesn't mean the unwanted search result has been cleanly suppressed. Not only does the link currently remain listed outside of Europe, Google places a notice in the results warning that something has been removed, which can "look rather fishy for the high-profile individual," he said.

What's more, Google will often write to the website publisher, advising that the link has been removed - to which a site may respond by making a high-profile public statement, drawing attention to precisely the information that you wanted to keep quiet. Still, that's more likely to happen in high-profile cases: for us ordinary types, there may be less fuss.

For Australians no such protections currently exist. According to Susan Walsh, Senior Associate at Swaab Attorneys (sjw@swaab.com.au, www.swaab.com.au) "There is currently no right under the Australian Privacy Act 1988 (Cth) (Privacy Act) for individuals to request an entity to delete their personal information. Individuals do have a right to request an entity to correct personal information held about them and the entity must take reasonable steps to do



Managing your firm's online reputation

It's not only individuals who overshare: companies have online presences, and they too can be caught out. Simon Wadsworth, managing director of reputation-management firm Igniye, said the first stage to fixing a troubling online reputation is to audit how bad it is - in other words, how easy is it to find the bad bits.

Next, he'll remove as much of the negative content as possible, checking sites' terms and conditions to see if there are grounds to have a review, comment or other troubling bit of content removed. "We'll get quite a lot of things removed from the source, straight away," he said.

"The second phase after that is to create as much positive content as we can, that we feel represents who they are now, what the customers are really saying about them," he said. The goal is to have positive comments show up higher in Google's search results than the negative ones.

Preventing oversharing is key. "At the company level, if you allow everyone to post on everything, then it's out of control by definition," Wadsworth advised. "It sounds boring, but you need to have policies in place for tweeting and posting, for Liking and sharing, for putting videos up. Anything that represents that company should, in an ideal world, go through one person. You need an equivalent of an online editor, someone who's saying no, that doesn't represent us, that logo's out of date, and so on."

so. Entities must also destroy or de-identify personal information that is no longer required for any purpose for which the personal information may be used under the Australian Privacy Principles (APPs)."

Susan goes on to explain that Australia lags behind EU initiatives in this area: "A recent Australian Law Reform Commission (ALRC) discussion paper has recommended a new APP which would give individuals the right to request destruction or de-identification. While the ALRC has also proposed a statutory cause of action for

serious invasions of privacy, there remains no Australian equivalent to the European fundamental right to privacy."

Even if you can't remove all the personal information leaked online, knowing what details are out there can help make you safer. For example, if your mother's maiden name is public knowledge, you can ask your bank to use a different question as a security check.

REINING IN YOUR SHARING

Even if you do manage to cover your online tracks, there's no way to know who accessed your information while it was out there. The moral is obvious: share less information in the first place. Do social media sites truly need your birthday? "It is nice to let your friends know, but it can be risky," said Wisniewski. "Everyone needs to decide for themselves."

Dr Golbeck suggests that one way in which you can stay relatively anonymous online is to use a nickname. "I have usernames that don't have anything to do with my name," she said. "If I have a statistics question, I don't want my professional name showing up on a stupid question, right? So I have a different account for that."

You should also be choosy about who you add as a friend, King advised. If you don't know a person, don't add them - and remember your friends may not be so discriminating. King revealed that intelligence firms commonly use such tactics to gain access to personal data: "Who can we befriend on Facebook so we can get to a user without them knowing about it?"

When it comes to privacy settings, it's always good practice to lock things down as far as possible - but, as we've mentioned above, even your best attempt to tighten settings may not guarantee your safety.

"We're starting to see what can happen if data gets into the wrong hands"

And it's important to be aware that a breach of your personal data isn't only possible via social media.

"Your personal information is just as likely to be exposed due to a database breach of some company," pointed out F-Secure security analyst Sean Sullivan. "Family names, location and interests are all bits of information that companies have on us. There's little we can do to safeguard much of it unless we just don't do business online. And that isn't really an option."

If you're worried about third parties leaking your data online, there are simple steps you can take to limit how much web retailers and others have on you. For example, Sullivan limits the exposure of his credit card by using gift cards to shop online. "This prepaid investment significantly reduces the number of purchases that I need to audit on my credit card statement each month," he explained. "It's reduced to one transaction, and I'm better able to spot any fraudulent use of my credit card."

Sullivan also uses multiple email addresses to keep personal information leaks limited, and takes the time to ask to be removed from unwanted "rewards" programmes. "If I don't frequently do business with a company, I kill the account and ask for my information to be purged," he said. "Sadly, that's probably too much management for most people."

NEXT-GENERATION SHARERS

Thankfully, for all the stories of robberies and lost jobs, this isn't necessary for most of us. The horror stories make the news because they stand out, not because they're the norm. "I'd say that the majority of people do a relatively good job of not sharing too much," said Sullivan. "It's easy to find people that overshare - we don't see evidence of those that don't. Because they don't."

Indeed, while younger generations certainly use Facebook, they spend more time on services where personal information is less likely to accumulate, said Dr Golbeck. "They're on WhatsApp, Snapchat and Whisper," she told us. "They're not using Facebook much - they tend to prefer the more ephemeral communication mediums."

Rafael Laguna, CEO of Open-Xchange, said that research by his firm also suggests that people are gradually coming to use social media more responsibly. "The way I like describing this is when you're young, you smoke," he said. "As you get older, you see more and more that smoking is bad for you, and most people stop smoking as they get older. I think it's the same with sharing. We're slowly growing up - not only teenagers, but even older people, who hadn't previously been using social media because it wasn't available. We're starting to see what can happen if that data gets into the wrong hands."

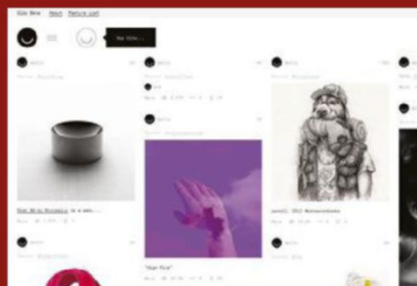
Even for those who do share too much online, the rest of us may become accustomed to it, said Wadsworth - and perhaps that's a good thing. "I think people will become more tolerant as generations go on. I think at the moment, people are judging people very quickly in all sorts of scenarios. But they'll realise that it's easy to make a mistake."

Hello ello

Facebook may be the biggest social network, but it's seen many challengers - remember Diaspora and App.net? The latest is Ello, an alternative social network that lets users communicate without selling their data to advertising networks. It launched in March 2014 with a few hundred users, and although the service is accessible on an invitation-only basis, millions are now using it. We spoke to co-founder Paul Budnitz to find out why he created Ello.

HOW DO YOU BUILD A SPACE THAT ENCOURAGES SHARING BUT NOT OVERSHARING?

On an ad-based social network, they really want you to be you. You're much more valuable if they know who you really are. With Ello, you're actually not required to enter anything except an email address,



so you can be anyone you want. We're not motivated to collect data for any reason other than to make the network better.

YOU'VE SAID THAT ELLO FEELS MORE POSITIVE THAN OTHER SOCIAL NETWORKS. WHY DO YOU THINK THAT IS?

It's like being in a casino. The vibe is negative: on average, most people are losing. I think the same thing goes on with ad-based social

networks. The customer is the advertiser, and the users are bought and sold. I think we feel that in subtle and not-so-subtle ways. I don't think there's any way to escape the negativity; I think it's built into the very fabric of the system.

YOU'VE DESIGNED ELLO TO WORK WITHOUT ADS, SO THE FOCUS ISN'T ON EXTRACTING INFORMATION. HOW DID THAT IDEA COME ABOUT?

Ello was founded as a private social network. We were tired of ads, and the idea that everything we posted was going into some data black box, and you can't even look at what's being collected about you. We thought that was creepy, and all of the things connected with that made social networking not very fun any more - boosted posts and ads, and the feeling that someone, somewhere on that social network doesn't have your best interests at heart. For us, that just became less and less fun.

Update your privacy settings

Facebook's privacy settings have been criticised in the past for being difficult to understand, but these days it's becoming easier. Here's how to protect your privacy from people who aren't your friends - although you should note that this won't stop Facebook from selling information about you to advertisers. The only way to do that is to delete your account.

1 QUICK CHECK

Click the padlock icon at the top right of your profile page and the first option you'll see is the Privacy Check-up, a quick way to identify immediate privacy concerns. This lets you check who will see your posts in the future - friends or friends of friends, for example - as well as disconnecting apps from your account and choosing who can see personal details such as your email, date of birth and hometown.

It's wise to limit these to friends only, rather than friends of friends, so that if one of your friends foolishly adds a dodgy contact, your own data won't be at risk.

2 PRIVACY

For more in-depth options, go to the full Privacy Settings And Tools page by clicking the lock icon and selecting "See More Settings". Here, Facebook lays out key details of who has access to your profile page.

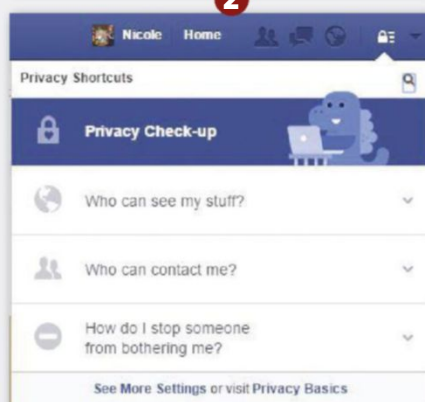
From here, not only can you restrict your future posts to friends as above, you can also limit who can see your old posts. This

Are you sure you want to proceed?

You are about to limit old posts on your timeline without reviewing them. Note: This global change can't be undone in one click. If you change your mind later, you'll need to change the audience for each of these posts one at a time.

Confirm

Cancel



will mean status updates, photos and other content you shared in the past publicly will no longer be visible to the world. Facebook will warn you that it's difficult to undo this, but don't get nervous: why would you want a stranger to have access to all your old posts?

On this page you can also change who can send you friend requests. If you're careful about whom you accept, there's no need to worry; if you're setting up a

privacy policy for someone who's less likely to be careful, you may want to set this to friends of friends, to cut out requests from complete strangers.

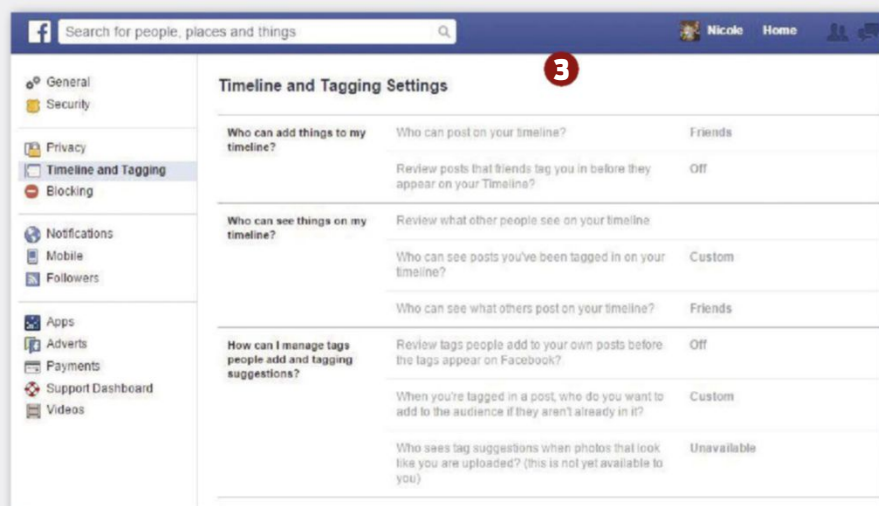
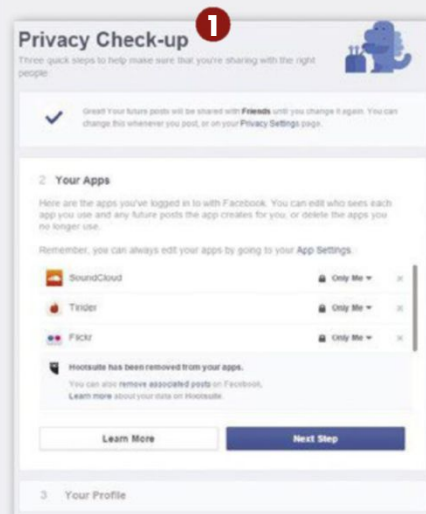
You can also change how people can search for you, hiding your email address or phone number, and ban search engines from linking to your timeline, meaning Google won't find what you post.

3 TIMELINE AND TAGGING

Next, click on the Timeline And Tagging settings in the menu to the left. Here, you can specify who can tag you in photos, post on your timeline, and view how your page looks to others. Click "View as" to see how your page would appear to a specific friend or the public - even on strict settings, your name, profile and cover photos, Likes and Groups will always be visible.

4 FOLLOWER SETTINGS

Facebook followers are people who aren't your Friends, but can still see your News Feed. Click Followers on the left-hand menu to ensure this is limited to Friends.



in Facebook

[Home](#) [Find Friends](#)


Follower Settings

Who Can Follow Me

Followers see your posts in News Feed. Friends follow your posts by default, but you can also allow people who are not your friends to follow your posts. Use this setting to choose who can follow you.

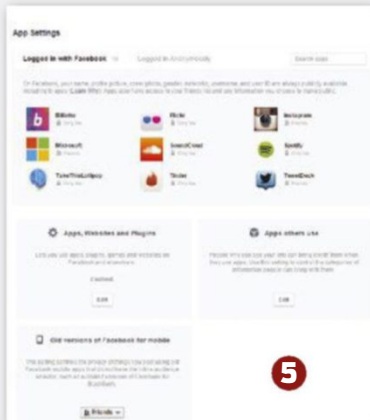
[Friends](#)

4

Each time you post, you choose which audience you want to share with.

[Learn more.](#)

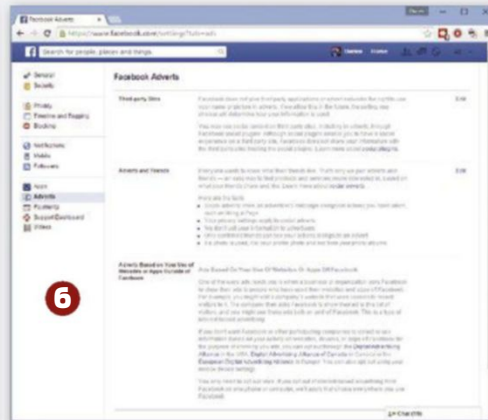
Want to know what followers can see? [View your public Timeline.](#)



5 APPS

Here you can see which apps are connected to your Facebook account. These apps can see key details such as your name, gender and, in some cases, your list of friends. Clear out any apps that you no longer use.

From here you can also turn off Platform, which lets you use Facebook to log in to other websites – and lets Facebook



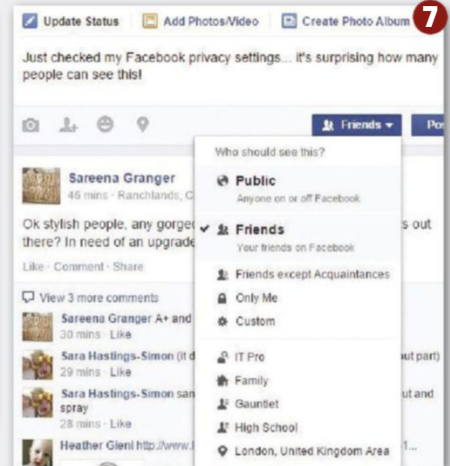
collect information about what apps and websites you visit. Click to disable this.

Next, under “Apps others use”, click Edit. Here, you can edit what information your friends can share about you when they use third-party apps. The language here is ambiguous: you should untick all the boxes to indicate that other people’s apps should know nothing about you.

6 ADVERTS

Continuing down the left-hand menu, select Adverts. At the moment, Facebook doesn’t give third-party apps the right to use your name in adverts – but it’s clearly considering it for the future. Click Edit to ensure it can’t. You can also opt out of Social Adverts, which show a friend’s name or image next to an advert because they liked its page. Select “No one” to opt out.

Lastly, Facebook offers a link to the



European Interactive Digital Advertising Alliance. Click through to opt out of Facebook’s behavioural advertising system, so you won’t see ads based on other websites you’ve visited.

7 UPDATING YOUR STATUS

The next time you share a comment, link or photo, note the “Friends” box at the bottom next to “Post”. Click that to change who can see your post, perhaps leaving out “Acquaintances” whom you don’t interact with often. You can add someone to your Acquaintances list who’s currently on your Friends list by clicking on the “Friends” box and scrolling down. You can also set a contact as Restricted, so they see only the posts you choose to make public – it’s sort of like unfriending them without the social repercussions.



THE MOST **ADVANCED** AND **CUSTOMIZABLE** SYSTEMS



ORIGIN
HIGH-PERFORMANCE PCS



FREE Lifetime Service & Support

© 2015 ORIGIN PC Corporation. All rights reserved. ORIGIN "O" Symbols are trademarks of ORIGIN PC Corporation. All other trademarks are property of their respective owners.

“ **RECORD-SETTING BENCHMARK PERFORMANCE.**
— **MAXIMUM PC**



ORIGIN

ORIGINPC.COM.AU

Call 1300 904 021



@originpcaus     

IN THE LABS

You won't find better reviews anywhere in Australia!

Data Collection

BEN MANSILL PUTS IT ON THE INTERNET

I don't know anyone who didn't raise a smirked eyebrow when 'The Cloud' first entered our sphere of attention. Mostly, it seemed, because it didn't make sense. Why would we want to 'store it on the internet?' Local storage was fine, and sensible, and cheap. People would ask me what this cloud thing is all about? They would have actually understood it was simply server-side storage, but understandably became confused by all the marketing rhetoric at the time, which painted a vague picture of many solutions to a problem that didn't exist, and all described in painfully non-specific terms. Marketing at its worst. Informing very few, muddying the picture as rival companies battled for differentiation, with the almost complete absence of a simple explanation. People thought there must be more to it because they couldn't pin down what it actually was.

But, today! It all makes good sense,

offers a now critical service, and permeates all of our devices. Through experience we now fully understand the value and utility of cloud storage – and how far beyond mere storage many extra services offer. So, to the Labs! We've gone in deep and tested all of the main players, as well as a few you may not have heard of, but are worth a closer look.

LAPTOPIA

If there's one area that's demanded a proper Labs roundup in PC & Tech Authority lately it's mid-range laptops. You, good readers, have asked for it, and I can in no way deny that it's an area we've not been complete in our coverage of lately, what with enormous gaming laptops and transformer/2-in-1 machines hogging the limelight.

We set a budget of \$1200 to \$2000, and ruled out any 2-in-1 machines.

Invitations were sent out, and laptops started rolling in. We had a couple of polite declines, which is always to be expected. Another couple dropped out... the HP machine, after we had completed the testing and written the review, was pulled when the local HP Product Manager realised we'd been sent an older model that was about to be superseded. Unfortunately we had little choice but to remove it from the results, because if you can't buy it, what's the point? This was all right on deadline so it was impossible to bring in a newer machine from HP. Two Acer machines were lost in transit, which is terribly unfortunate and we do feel bad for the local Acer reps who worked hard to get us those machines, and as far as I know are still trying to locate the MIA laptops. We'll have stand-alone reviews of those machines in future issues, hopefully the next one.



MICROSOFT
SURFACE 3
37



LG 34UC87
21:9 MONITOR
41



SAMSUNG
T1 SSD
44

EDITORIAL & PRODUCT SUBMISSION: PC & Tech Authority welcomes all information on new and upgraded products and services for possible coverage within the news or reviews pages. However, we respectfully point out that the magazine is not obliged to either review or return unsolicited products. Products not picked up within six months of submission will be used or donated to charity. The Editor is always pleased to receive ideas for articles, preferably sent in outline form, with details of author's background, and – where available – samples of previously published work. We cannot, however, accept responsibility for unsolicited copy and would like to stress that it may take time for a reply to be sent out.

WHAT OUR A-LIST MEANS

Our A-List award is reserved for the best products in each category we review. With a winner and an alternative pick in each, that's 92 products you know are first class.



WHAT OUR AWARDS MEAN

PC & Tech Authority's comprehensive Real World testing sorts out the best products from the pack. Any product recommended by PC & Tech Authority is well above average for features, value for money and performance.



WHAT OUR RATINGS MEAN



HOW WE TEST

Our benchmarking tests are the best in the business. Read on to find how they work...

2D TESTS

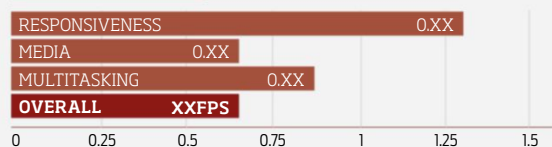
We test desktop PCs, netbooks and laptops with our own, custom-built, 2011 Real World Benchmarks.

We split the results into three categories: Responsiveness, Media and Multitasking, with the Overall score an average of the three sub-scores.

For instance, responsiveness replicates light browser and productivity workloads. The Media test involves running iTunes for audio conversion, Photoshop CS5 to crunch large images and Sony Vegas 10 to edit home video. This then gets run simultaneously alongside Cinebench 11 in order to get a handle on the multitasking ability of the system.

BENCHMARKS

3.4GHz Intel Core i7-2600K, 4GB DDR3 = 1



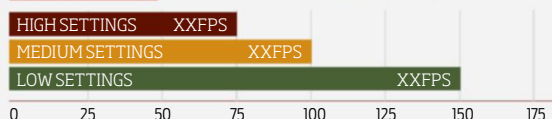
3D TESTS

We use pre-recorded demos in Crysis and DIRT 3 to test gaming performance where relevant. We have three standard test settings, depending on the power of the graphics card: Low, Medium and High.

To test gaming performance, we use our own recorded Crysis benchmark. We use the Low, Medium and High quality settings in 1366 x 768, 1600 x 900 and 1920 x 1080 screen modes respectively. Very high-end systems can also be tested using the ultra-intensive Very High settings, with all detail switched on, and varying levels of anti-aliasing enabled.

3D SPEED

■ GOOD ■ PLAYABLE ■ UNPLAYABLE



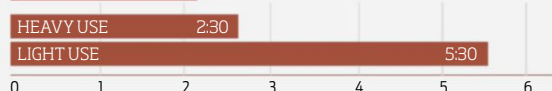
LAPTOP BATTERY LIFE

We subject laptops to two battery tests. In the light-use test, we optimise the system settings for the greatest power efficiency. We then disconnect the mains and run a script scrolling a selection of web pages until the system shuts down, giving you a realistic idea of the surfing time each laptop offers.

For the heavy-use test, we engage Windows' High Performance power profile, set the display brightness to maximum, and allow the taxing Cinebench 3D renderer to push the processor load to the limit. This gives a worst-case figure, revealing how long you can expect the battery to last under the most demanding conditions.

BATTERY LIFE

HOURS:MINUTES



REVIEWS

LAPTOP
GROUP TEST
52



■ PCS & LAPTOPS

Dell XPS 13	56
Lenovo ThinkPad T550	57
Apple MacBook	54
Asus Zenbook UX305	55
MSI PE60-111AU	58
Toshiba P50W	59
HP Spectre 360	34
Intel Core vPro NUC	35
Acer Revo One	36
Microsoft Surface 3	37
Asus T300 Transformer Chi	39



■ COMPONENTS

Supermicro GS50	45
Project CARS	76
Wolfenstein: The Old Blood	78
Warhammer 40K: Regicide	79



■ WEARABLES

Microsoft Band	45
Bose QC 25	44

■ SOFTWARE

Adobe Lightroom	47
Ubuntu 15.04	48
Microsoft Office 2016 IT Pro and Developer	49
Box	67
OneDrive	68
Amazon Cloud Drive	70
Apple iCloud	70
Bitcasa Drive	71
Dropbox	71
Google Drive	72
Livedrive	72
Mozy	74
SugarSync	74

■ HANDHELDS

Huawei P8	46
D-Link Portable Digital TV Receiver	44
Mophie Juice Pack Air	45

■ PERIPHERALS

Viewsonic VP2780-4K	38
LG 34UC87 21:9 monitor	41
Belkin WeMo	42
Samsung T1 SSD	44
G Drive ex Raw	44
Sound Blaster E5	45
MSI Panocam	45



HP Spectre x360

POWERED-UP BLING FOR THE USER WHO WANTS IT ALL

At \$2400 this is an expensive notebook PC, at least by today's standards. But how quickly we forget those branded "laptop" displays in boutique stores back in, say, 2002 where gloriously plastic and chunky machines boasted of their 256MB RAM as halogen spotlights gleamed off their \$5500 price tags. Yes, the world has moved on, and today \$2400 gets you a hell of a lot of computer.

Apparently HP designed the Spectre x360 in close consultation with Microsoft, despite the existence of the Surface and the, uh, Xbox 360. The result, as everyone who I showed it to noted, is a notably clean Windows install. Very little bloatware, just a smattering of pointless HP user assistance rubbish and an inevitable trial installation of McAfee to mess up your initial attempts at getting on a network.

The major selling point of this machine, with regards to form-factor, is the way the display folds right back, putting the Spectre into tablet mode. This disables the keyboard and also explains why the power button is on the side, along with a small Windows button too.

This top end version rocks a 2.4GHz i7 CPU and 8GB of RAM, which it uses to drive a 2560x1440 display with 10-point touch. That might not be full-on Apple Retina levels of resolution, but it's

close. The necessarily glass panel feels expensive, but attracts plenty of greasy fingerprints. Otherwise, colour, brightness and viewing angle from the IPS display are all excellent.

The 1.59cm-thick chassis itself is machined from a single block of aluminium, which is pretty much de rigueur nowadays. The keyboard feels good to work at, but there's a quirk: in a brightly lit room, if you switch on the keyboard backlight, the white-on-silver keys are slightly hard to read. But if you switch the backlight off, the F5 key (which is also the backlight toggle) lights up, which can be distracting. As much as they'd spoil the bling, I tend to think black keys with white letters might have been a better choice... though the resemblance to a MacBook Pro might then have been too hard to ignore.

Performance, given this is an i7, is suitably impressive. Indeed, it's the performance that brings to mind those \$5500 laptops of yore, which were always inferior to the equivalent desktop. And yes, for \$2400 you can build a more powerful ATX PC, but gap continues to close, and in terms of day-to-day use - even very serious use - this thing screams.

Actually, it screams literally, with audible fan noise from a generous exhaust port on the left-hand edge.

Staying power is another selling point, with HP claiming over 12 hours between charges of the 56.5 Watt-hour battery. That seems possible for folks tapping out a bestseller or idly flipping through presentation slides, but once you start using the Spectre as intended - an all-in-one entertainment device - you'll more likely see 9-10 hours from a charge. Still very good.

It would be interesting to do some

follow-up research and see how many owners of this thing actually end up making use of the "four modes" HP excitedly shows off in the adverts. The difference between "tent mode" (standing on two ends, display-out with hinge at the top) and "stand mode" (display out, keyboard down on table) seems, uh, subtle. And if I'd personally spent \$2400 on this I'm not sure how willing I'd be to have the keyboard just dragging around on hard surfaces all the time with damage potential high.

Of course, at over 13-inches on the diagonal and 1.48kg in hand, the Spectre x360 makes for a rather unwieldy tablet. But then, it has that in common with almost all Windows-based convertibles.

A collection of proper ports, including three USB and full-sized display port and HDMI, is welcome, but like so many slim notebooks you'll need to bust out a USB-to-Ethernet dongle to get online at work. Still, most people will use the 802.11ac Wi-Fi of course.

While the convertible capabilities of the Spectre are welcome enough, really it's this machine's ability to be a solid workhorse that gives it most of its marks. It's fast, well-built, has an excellent display and very good battery life. Maybe a black one would have been nice, but you can't have it all, right?

Anthony Fordham

KEY SPECS

\$2399 • www.hp.com/spectre_x360
2.4Ghz i7-5500U • 8GB RAM • 512GB SSD • 13.3" 2560x1440
10-point touchscreen • reversing-hinge for tablet mode •
Windows 8.1 w/ tablet mode, 1.48kg

OVERALL





Intel's 5th Generation Core vPro NUC

NUCS FOR PROS

Intel's Next Unit of Computing, or NUC, was a revelation in space-saving computing. Forget the Small Form Factor PCs from the likes of Shuttle; Intel's original NUC delivered desktop performance in a chassis only slightly larger than a pack of cards. It's received several refreshes since first launching in 2012, and the latest version now comes packing Intel's Core i5-5300U vPro processor, along with a selection of improvements across the board. It's still carrying a rather hefty price tag though, which doesn't include any RAM or hard drive, so let's see if it can justify the \$600+ it'll cost to save you a chunk of desk space.

For the price, you get a PC that measures just four inches square. Inside resides the new Intel CPU, and unlike other NUCs uses a small fan for cooling.

It remains relatively quiet even under intensive workloads, perfect for those who hate noisy computers. Removing the bottom of the case reveals the twin DDR3L SODIMM slots, which run at either 1333MHz or 1600MHz, and can accommodate a maximum of 16GB of memory. A small 2.5 inch hard drive slot is built into the base, with a SATA extension cable to connect it tidily to the system's mainboard, but no drive is included. There are also twin M.2 connections for these tiny new SSDs, one supporting the 22x42 format, the other the 22x80 type. Twin USB 3.0 connections on the front are supplemented by another two on the rear of the case, with another two internal USB 2.0 headers.

There really isn't any room to install additional components within the chassis, nor to add another two USB ports

on the exterior, but the internal headers can be used to connect to a variety of third-party replacement lids.

Video duties are handled by twin mini DisplayPort 1.2 outputs, while a single Gigabit Ethernet port delivers connectivity to your network. While DisplayPort is becoming the new standard in display connectivity, it's still rather limited in its availability, especially the mini variety. We had to visit several stores to find a mini DisplayPort adaptor, as we couldn't find a miniDisplayPort to DisplayPort cable, which limited our output to just 2560 x 1440, well short of the 4K resolution supported by this connection type. We wish Intel had of replaced one of the miniDP ports with an HDMI port instead, as it would prove to be much more usable to a wider audience.

Interestingly there's no Wi-Fi support built-in, unlike competing mini-PCs from Gigabyte, which is a bit of an oversight for home users. You'll either have to shell out for the optional Wi-Fi card, or connect the NUC to your network via Ethernet cables. Audio is also handled by the miniDisplayPort, which will prove to be a killer blow for those looking for a HTPC machine, as the only other audio output is a 3.5mm stereo minijack. It should be apparent by now that Intel is aiming this device at corporate and office users rather than home consumers.

The Intel Core i5-5300U vPro CPU that powers this NUC is a twin-cored model blessed with HyperThreading. The base frequency of 2.3GHz ramps up to 2.9GHz when Turbo mode is enabled, yet the TDP is a meagre 15W. This includes Intel's HD Graphics 5500, which are capable of 4K decoding. As a result of using the new Intel chip, this NUC has Intel vPro support, which offers a range of technologies that deliver added security and wireless connectivity... provided you install the optional Wi-Fi adaptor.

Prospective owners can add another \$350 or so to the purchase price to install memory and storage, along with the Wi-Fi adaptor necessary to make the most of vPro's wireless connectivity options.

It's not aimed at home users, but corporate buyers who rely heavily on Intel's business focused-features will find this to be a potent desktop.

Bennett Ring

KEY SPECS

\$629 · www.intel.com.au

Intel Core i5-5300U vPro CPU (2 Cores, HyperThreaded, 2.3GHz base, 2.9GHz Turbo) · up to 16GB of DDR3L SODIMM · support for 2 x M.2 drives (1x 22x42, 1x 22x80)

OVERALL





Acer Revo One RL85

ACER'S ATTEMPT TO REDEFINE THE DESKTOP PC IS AN ATTRACTIVE, SURPRISINGLY FLEXIBLE BOX OF TRICKS

Compact Windows PCs such as Intel's NUC have been steadily becoming a more common sight across the industry in recent times, and we've seen none cuter than Acer's compact Revo One RL85.

The model sent in for review runs Windows 8.1 64-bit with Bing, and crams a fourth-generation Intel Core i3-4005U CPU, 4GB of RAM and a 2TB hard disk into a case that's little bigger than a coffee caddy.

It's a pretty little thing. From the front, its soft curves and glossy white finish make it look more like a swanky Bluetooth speaker or an extrovert air freshener. Fortunately, it's a bit more useful than both.

Look around the rear of the Revo and you'll see a stack of PC-style ports arranged in a narrow strip. At the top is a pair of USB 2 ports for the connection of keyboard, mice and other low-speed devices.

There's a Gigabit Ethernet port below these, followed by another pair of USB sockets – USB 3 this time. Video outputs come next: you get HDMI and

> Some versions of the Revo One come with a double-sided media-centre remote control

mini-DisplayPort, then a 3.5mm headset jack and a Kensington Lock slot. On top sit four white status LEDs and an SD slot.

A wireless keyboard and mouse was included in the box with our review sample, and these work passably, but feel rather cheap. In a slightly crazy bit of design, though, you have to use up one of your precious four USB slots with the accompanying wireless dongle.

We'd much rather have the double-sided remote control, which comes with some other models of the Revo One. This has a clickable touchpad/five-way D-pad alongside play, pause, skip and volume controls on one side, and a rubber-keyed Qwerty keyboard on the reverse side for thumbing in search terms.

If you're intending to attach the Revo One to your TV, however, we'd counsel downloading and installing third-party media-centre software such as XBMC or Plex, since the included Acer software isn't particularly feature-packed.

Still, there's plenty else to like about the Revo's design. Impressively for such a small PC, access to the internals



< Cute and compact, the Revo One RL85 packs in a huge amount

is good. At the press of a button, it's possible to quickly whip off the top of the case and get inside, as if it were a tiny Mac Pro.

Beneath the white plastic sheath are two free 2.5in hard-disk bays, complete with quick-release caddies. And, with a small screwdriver and a bit of patience, it's also possible to access the system drive sandwiched between them, the single RAM slot and the dual-band 802.11n wireless card, which here is of the single-band 802.11n variety.

There's even RAID capability included. Our Revo came with a single 2TB drive mounted in the least accessible of the system's three drive bays, but add further storage devices and it's possible to configure your drives in RAID0, RAID1 or even RAID5, depending on your requirements.

Performance is perfectly respectable, but you won't be using this as a video-editing rig. In our benchmarks, the mobile, Haswell-generation Core i3-4005U CPU and 4GB of RAM powered our Revo One RL85 to an overall score of 18. That's closer to the score of the Core M-powered Asus Transformer Book T300 Chi hybrid than a full-blown desktop Core i3.

It is what we'd expect for the money. Intel's even smaller barebones NUC PC, for instance, can be built to a similar specification – with a 1.7GHz Core i3-4010U Intel NUC, 120GB mSATA hard disk, 8GB of RAM, Windows 8.1 and a wireless card – for around the same price. You won't get the same neat chassis and multiple hard disk capability, however.

There is a cheaper model available. The Revo One RL85 (part number: DT.SYUSA.004) comes with a more basic 1.4GHz Intel Celeron 2957U, 4GB of RAM and a 60GB SSD costing \$419.

The Revo One RL85 is a pretty good deal: it's neat, well designed and reasonably priced, and the extensive storage and RAID options mean it can act not only as your main deskbound PC and media hub, but also as the main data repository for your home. It's well worth considering.

Jonathan Bray

KEY SPECS

\$949 • www.acer.com.au

1.7GHz Intel Core i3-4005U • 4GB RAM • Intel HD Graphics 4400 • 2TB hard disk • Gigabit Ethernet • 2 x USB 3 • 2 x USB 2 • HDMI • mini-DisplayPort • SD slot • Windows 8.1 64-bit with Bing • 1yr RTB warranty • 106 x 152 x 107mm (WDH)

OVERALL





Microsoft Surface 3

THE BABY SURFACE

It was a long journey for Microsoft to get to this product. You could look at it as the next-gen successor to the Surface RT, and indeed it is. The smaller form factor of previous RT machines was appealing, and sat well with the idea of a transformable tablet/laptop, but Windows RT, for better or worse, never caught on enough to warrant Microsoft sticking with that platform. RT Surface machines were also hobbled with an ARM-based Tegra processor, which made running full Windows an unhackable technical impossibility.

This new device is what the loudest voices have been begging for over the years. But it's not so much the Windows RT lineage that really drives what this is – it's more the success of the big brother Surface Pro 3 and its wins with form factor and design that's driven the Surface 3. With the new Surface 3, we have a baby Pro that's smaller, lighter, cheaper and less powerful. Any one of those reasons – apart from the slower CPU – may be reason enough for someone to choose the Surface 3 over the Pro 3.

The Surface 3 runs full Windows 8.1, which will soon become Windows 10 for free as part of the upgrade program. **That's made possible by the CPU, which is now an Intel x86 chip. What's more, it's the first device to sport Intel's new Cherry**

Trail Atom. With this SoC, Intel is pushing harder than ever into the mobility space, and is keen to dispel the poor reputation Atom was saddled with from the early netbook days. The new Atom sits below Intel's also-new Core M, which in turn sits below the desktop i3/i5/i7 range. The x7 version in the Surface 3 is the fastest of that family, running at 1.6GHz and burst mode up to 2.4GHz. It's a fanless design, and consumes a mere 2w in operation. So, you won't find the space-consuming vents as seen on the Surface Pro 3, and battery life benefits, with the Surface 3 good for around 10 hours of operation. Subtract 2-3 hours for intensive tasks, but overall it's still a couple of hours better than the Surface Pro 3.

The quad-core part is sufficient to drive Office apps and have two running simultaneously. Any more than that and you'll be taxing the system memory, not so much the CPU. Of the two available configurations, the 128GB SSD/4GB RAM model, at \$839 is obviously much more desirable than the lesser 64GB SSD/2GB RAM version (\$699). However you can do a lot with the 2GB model if your goals are a mobile Windows PC that can handle light tasks, and that's the whole point of this device. It's not designed as a powerhouse, that's what the Surface 3 Pro is for.

Onboard storage can be supplemented via a microSD card via the included slot.

The smaller screen size (10.8in vs 12in for the Pro 3) suits the mobility focus, but much more interesting is the shift to a 3:2 aspect ratio. Almost every laptop and most tablets today are a 16:9 ratio, including the Surface Pro 3, but that means less vertical screen real estate and that's a bit of a bother when you consider that's actually where you want screen size in a portable device, given that

a taller aspect ratio lets you see more of the work you're doing, or the web page you're browsing. It's a bit of a gamble for Microsoft – 16:9 screens look nicer in a showroom – but it's a design win for practicality and we hope it inspires a new trend.

The moderately powerful and eminently portable Surface 3 loses some of its dazzle when you throw the Type Cover keyboard into your shopping trolley. It's a fine keyboard alright, with a slightly quieter and springier feel than the Pro 3 model – but it's \$180. The whole design ethos of the Surface range is centred around the detachable keyboard and the functional versatility it brings. Yes, the Surface 3 is a fine Windows tablet, and the cool magnesium case and fabulous three-position kickstand add a lot of appeal, but at the end of the day you know you're probably buying it so you can get the keyboard with it. Unfortunately the combined price edges the overall cost into premium tablet territory, or even that of an entry-level ultrabook. On the flipside, a 1 year subscription to Office 365 Personal is included.

Nevertheless it sits in the market as a clever idea executed supremely well. Its design and build quality is second to none, and its mobile utility is very appealing.

Ben Mansill

KEY SPECS

\$699 (64GB/2GB RAM), \$839 (128GB/4GB RAM) • www.microsoftstore.com

Atom x7-Z8700 @ 1.6GHz, 2.4GHz burst • 10.8in 1920 x 1280 3:2 10-point multi-touch screen • Surface Pen support • 802.11 a/b/g/n/ac • 1 x USB 3.0 Mini Display Port microSD

OVERALL





ViewSonic VP2780-4K

AN AFFORDABLE, GOOD-QUALITY 4K MONITOR FOR \$1200 - IT'S NOT UP TO PROFESSIONAL STANDARDS, THOUGH

There's no two ways about it: the ViewSonic VP2780-4K is something of a bargain by the standards of professional monitors. It still isn't cheap, but this 27in monitor packs in everything you could reasonably expect for the cash. Take a 3,840 x 2,160 IPS panel, add in a decent selection of features and inputs, throw in a zero-pixel-defect guarantee, and for around \$1200 and you have a recipe for success.

As a member of ViewSonic's professional VP range, the VP2780-4K comes perched atop a fully adjustable stand that provides tilt, swivel and 150mm of height adjustment, and flips around into portrait mode. It isn't as solid-feeling as pricier models, but it works well: the huge claw-like base keeps the monitor rooted to the spot, yet still allows for easy one-handed adjustments.

Connectivity hits the mark, too. The DisplayPort, mini-DisplayPort and HDMI 2 inputs all support 10-bit colour and 60Hz refresh rates, and a further pair of MHL 2-compliant HDMI inputs provide extra scope for connecting

smartphones, tablets and other devices.

That might sound like overkill, but the ViewSonic's picture-in-picture and picture-by-picture functions are capable of displaying up to four Full HD video sources simultaneously onscreen. Factor in the presence of a four-port USB 3 hub – there are two ports positioned at the rear and a further two on the left-hand edge – and the VP2780-4K has all the essentials nailed.

ViewSonic is also confident about the VP2780-4K's image quality: it claims that the IPS panel provides 100% sRGB coverage with a Delta E colour difference of less than 2.

Subjectively, there's very little to complain about. The VP2780-4K's semi-gloss, anti-glare coating adds a slight graininess to onscreen images, but the flipside is that viewing angles are excellent: we saw little evidence of the usual off-axis IPS glow. Blacks remain deep and true even when viewed from an angle. This is something of a coup at the price, as you normally pay a hefty premium for IPS panels with glow-defeating polarising layers.

Colour fidelity

is pretty much bang on ViewSonic's claims. In the factory-calibrated sRGB mode, the VP2780-4K covered 98% of the sRGB colour gamut, with an average Delta E of 0.73 and a maximum deviation of 1.3. Contrast reaches a very impressive 1,207:1, and the only disappointment is that the colour temperature was way off on our review model, measuring at a 6,029K rather than the intended 6,500K. The result is that images are reproduced with a warm, reddish tint; a shame given the solid performance elsewhere.

Sadly, the panel's backlighting isn't up to professional standards either. We calibrated the monitor to a brightness of 120cd/m² measured at the centre of the screen, then tested the brightness across 15 points on the panel. Our X-Rite colorimeter revealed that the entire lower third of the display was between 9% and 18% dimmer than at the centre, and that the upper left and right corners were unevenly lit, too, measuring 11% dimmer than at the centre. By comparison, the best professional monitors normally deviate by less than 5% across the whole panel.

One final chink in the VP2780-4K's armour is its onscreen display: it's incredibly basic. The crude-looking interface doesn't instil much confidence, and the touch-sensitive buttons on the monitor's front are annoyingly unresponsive at times, requiring several prods to achieve the desired results. Thankfully, it's not something you'll need to battle with on a regular basis, but the clunky controls make it something of a faff to engage the various picture-in-picture and picture-by-picture modes.

Despite its faults, the ViewSonic VP2780-4K has much to recommend it. The array of features and connectivity is impressive; the image quality is pretty good; and the zero-pixel-defect guarantee is a major plus point. This isn't a true professional display – those who need superior colour fidelity would be well advised to spend the extra on a monitor with more refined backlighting, such as the NEC MultiSync PA272W – but if you can live with the compromises, the VP2780-4K offers solid value for money.

Sasha Muller

KEY SPECS

\$1200 • www.viewsonic.com.au

27in 3,840 x 2,160 IPS display • DisplayPort • mini-DisplayPort • 3 x HDMI • 4 x USB 3 • 3yr C&R warranty • 643 x 348 x 470mm (WDH)

OVERALL





Asus Transformer Book T300 Chi

ASUS HARNESSSES INTEL'S CORE M PROCESSORS TO CREATE AN ALLURING WINDOWS HYBRID THAT RIVALS THE SURFACE PRO 3

The T300 exudes the kind of high-end charm that we'd expect from a device a good deal more expensive than its price. The 12.5in tablet and keyboard dock are a handsome couple: hewn from chunks of aerospace-grade aluminium and finished in a deep metallic blue, with the brushed metal framed by bevelled edges skirting neatly around the sides.

Meanwhile, Asus' choice of Intel's low-power Core M processor has enabled it to pare down the size and weight. The tablet is 1.2mm thinner than the Surface Pro 3, at 7.9mm, and 80g lighter at 720g. In fact, the only physical disappointment is that the T300 is rather weighty once you factor in the keyboard dock.

Still, there are plenty of plus points. The weight in the base counterbalances the tablet to stop it toppling backwards. And while the screen doesn't tilt back as far as a traditional laptop, it folds back enough to prove usable – and stable – on a lap. Factor in a comfy, spacious keyboard that's pleasant to type on, and a touchpad that works well, and you have a hybrid that's genuinely usable as a laptop.

The keyboard, which is now held in place by a strip of super-strong magnets, and connected via Bluetooth rather than a physical connection. This means that the keyboard needs to be charged separately to the tablet via its micro-USB connection, but this shouldn't be a regular occurrence: after a full charge, our keyboard lasted well over a week during testing. And the Bluetooth connection allows the keyboard to function even when it isn't directly connected – hook up the tablet to a monitor or TV, or just prop it up nearby, and you can control it remotely from several metres away.

There's a microSD slot and a headset jack, as well as 802.11ac and Bluetooth 4, but the tablet's slender edges leave no room for full-sized ports. Instead, Asus has resorted to micro-HDMI plus a single micro-USB 3 port, and supplies an adapter in the box to expand the latter to two full-sized USB 3 ports.

With a 1.2GHz Intel Core M-5Y71 processor, 8GB of RAM and a 128GB SSD, the Asus should feel sprightly. Indeed, while the Core M-5Y71 sips a mere handful of watts, it can boost up to 2.9GHz for short periods. What's more,

the Core M is capable of delivering those speed bursts without the need for a fan. The metal rear of the T300 becomes warm under normal use, but not to a worrying degree. It was only once we started hammering the Asus flat out with our benchmarks that it became uncomfortably hot to the touch.

Performance was sluggish on occasion, particularly during heavier multitasking. We'd point the finger at the low-power 128GB SanDisk i100 SSD, which sacrifices small-file read and write performance in order to minimise power draw. In the AS SSD benchmark, the i100 SSD achieved read and write transfer speeds of only 11MB/sec.

Battery life isn't as good as we hoped – and especially not given the presence of a power-efficient Core M CPU. With the screen calibrated to a brightness of 120cd/m2, the Asus lasted for 5hrs 37mins in our looping 720p video test; short of Asus' claim of eight hours. The T300's display is astonishingly good. A 2,560 x 1,440 resolution stretches across the 12.5in panel, delivering sterling performance. Brightness tops out at a creditable 372cd/m2, contrast hits 1,243:1, and the panel dredges up an impressive 98% of the sRGB colour gamut.

Colour accuracy is the only area where the T300 drops behind the Surface Pro 3, with an average Delta E of 2.66 to the Surface Pro 3's 1.77.

We found the touchscreen to be superbly responsive, and the pressure-sensitive inking with the bundled stylus works beautifully too. The Transformer Book T300 Chi is a competent hybrid. The display is superb, the design attractive; this is a hybrid that performs well in both tablet and laptop roles. There's room for improvement – but, for the money, its flaws are ones we could live with. If you've been looking for an affordable, more flexible alternative to the Microsoft Surface Pro 3, the Asus Transformer Book Chi T300 is worth considering.

Sasha Muller

BATTERY LIFE



KEY SPECS

\$1599 • www.asus.com.au
 1.2GHz Intel Core M-5Y71 • 8GB RAM • 128GB SSD • 12.5in 2,560 x 1,440 touchscreen • Intel HD Graphics 5300 • 802.11ac Wi-Fi • Bluetooth 4 • tablet: 720g; tablet and keyboard: 1.43kg • 318 x 192 x 18.6mm (WDH) • 1yr warranty (customisable to 3 years)

OVERALL





NexStar® EXTERNAL ENCLOSURE
WiFi



Portable & Wireless



Support USB 3.0 Transfer
Rate Up To 5Gbps



Supports Internet Tethering
So You Can Access the
Internet While Connected



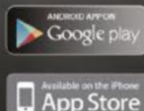
Support Wi-Fi 802.11
b/g/n Transfer



Download App Available
on the App Store and Google
Play Market



5000 mAh Battery
Up to 6 hours of
continuous play



Get it on your smart device!

You can find these at the following retailers:

ADE	Allneeds Computers	allneeds.com.au
BRI	Umart Online Computer Alliance	umart.com.au computeralliance.com.au
MEL	PC Case Gear Centre Com	pccasegear.com centrecom.com.au
PER	Austin Computers PLE Computers	austin.net.au ple.com.au
SYD	Mwave Online Computer	mwave.com.au onlinecomputer.com.au

LG 34UC87

34" 21:9

Monitor

LG AT THE TOP OF THE COMPUTER MONITOR GAME WITH A CURVED 34" UWQHD BEAUTY.

On a desk, this monitor is beautifully imposing. With a 34" diagonal size and 21:9 display ratio, it's like having two monitors glued into a single display – stunning. There aren't as many pixels on this panel (3440x1440) as a 4K UHD panel (3840x2160), but it's still a monstrous amount of screen real estate, so ensure your computer can cope. HDMI won't handle it at 60Hz, you need a graphics card with DisplayPort output.

At the rear, there are two Thunderbolt 2 ports for the Mac users (one input, one daisy chain output), two HDMI 1.4 ports and a DisplayPort input. There are the usual built in speakers embedded into the monitor, even given a dubious marketing moniker of MaxxAudio (that's Maxx, not Max, remember that), but they're not good for much beyond system notifications. A 100mm x 100mm VESA mount adorns the back if you have your own funky stand to mount it on. The included stand has height adjustment, but no pivot or swivel.

There's a USB 3.0 hub in this monitor too, but there's no ports on the side, making it a pain to reach around the back to plug things in frequently. On a monitor this price, it'd be nice to have a port or two within easy reach for USB flash drives and temporary devices.

Panel quality is exactly what you'd expect from a top of the line LG display. 99% sRGB gamut coverage and 10-bit colour means that colours are accurate and rich. The image is sharp and colours have been calibrated in the factory for a great out of box image. If you've upgraded from a TN-type display, the quality will blow you away.

The 21:9 screen ratio is fantastic. I dabble in video editing with Final Cut Pro and having the timeline stretch so wide is great. Those doing audio work will also love a wide timeline and lots of dials and faders on screen simultaneously. Even daily productivity use, having my text



editor right next to my web browser, is a better experience than dual displays.

Now for the burning question – what's the curved screen like? This is the first time a curved display has graced my humble abode and unfortunately, I can't see what the fuss is. The curve is very subtle and only apparent at the very edges of the display. Even then, it appears to me that the image is wrong, rather than enhanced. It's supposed to be a little more immersive, but I didn't get that feeling at all. For those doing graphics work, it actually distorts the image, giving it a pincushion appearance that's deceiving and counter-intuitive. Based on my experience with this display, I'd save the cash and go for a non-curved model instead for design work.

If you're in the market for such a monitor there's not a lot of competition. The only other curved 34" 21:9 LCDs are the similar priced Dell U3415W and more expensive Samsung S34E790C. The Dell uses the same LG panel as the 34UC87 with the main difference a lack of Thunderbolt and a better stand. Compared to the Samsung S34E790C, the LG 34UC87 has an IPS panel that's great for colour accuracy and desktop computer use, whereas the Samsung uses a VA panel providing better black levels and contrast for movies.

The LG is cheaper, so the Samsung is

hard to recommend.

What if you don't need the fancy and in my opinion, unnecessary, curved display? LG have the 34UM95, which is only \$100 less than the curved 34UC87, but the AOC U3477PQU and Philips BDM3470UP, both approximately \$900 are good options too, with similar IPS panels. You can save a few hundred bucks by foregoing the actual curve.

These 21:9 monitors are beautiful and very easy to fall in love with. Sure, they're expensive, but how much of your life do you spend staring at a computer monitor? Far too long, I'm sure, so treat yourself to all those glorious pixels, you deserve it – and if you want your pixels curved you can't go wrong with the LG 34UC87. It's one of the best monitors I've ever used. The only thing that could top it is a 4K UHD curved 40" display – come on LG, you know you want to.

Anthony Agius

KEY SPECS

\$1549 • www.lg.com/au

34" diagonal screen • 3440 x 1440 resolution • 21:9 aspect ratio • curved • 10-bit IPS panel • 99% sRGB colour accuracy • Thunderbolt support • 2x HDMI • 1x DisplayPort • 2x USB 3.0

OVERALL



Belkin WeMo Home Automation

IT'S NEVER BEEN EASIER TO AUTOMATE YOUR HOME WITH BELKIN'S WEMO DEVICES

Home automation used to be the domain of rich home owners willing to spend thousands of dollars to have their blinds automatically open at certain times of the day, or a plethora of lights controllable via a touch screen. They'd need to enlist the services of a home automation specialist who knows the ins and outs of esoteric protocols like X10 and C-Bus and can find the obscure products to interface with them. But in 2015, thanks to buzzwords like the Internet of Things and the prevalence of smartphones and tablets, what was once niche and expensive is now widespread and (relatively) cheap. Belkin's WeMo range of home automation products are more accessible and easy to use devices currently on the market.

You'd think setting this sort of thing up would be difficult, but it's surprisingly simple. WeMo devices are based on Wi-Fi and most of us have already Wi-Fi in our homes. When you take a WeMo device out of the box and turn it on, it creates its own Wi-Fi network that you connect a smartphone to. Once connected, the WeMo app guides you through adding the device to your existing Wi-Fi network. No IP addresses to configure, no scripts, no serial ports and no tiny little DIP switches. Remote access is ingeniously handled via

Belkin's cloud service, no need to open up ports on a router to run a server at home or set up dynamic DNS services.

The basic product in the WeMo range is a switch (RRP \$69.95) that can turn things on, or off, direct from your smartphone, at home or away, with barely any configuration. Use an electric heater and want to turn it on 30 minutes before you arrive home from work? If it's plugged in to the WeMo switch and you've got Wi-Fi at home, just launch the WeMo app on your phone and turn the heater on with a single tap. That's literally how easy it is to use.

Also in the WeMo line-up are LED bulbs (RRP \$179.95 for a starter kit, \$59.95 for additional bulbs), which can be installed anywhere and allow lighting to be controlled via a smartphone without any new wiring. The WeMo motion sensor (RRP \$79.95 and includes a switch) can detect when movement occurs, or when someone enters a room and turn things on or off based on that motion. New to the WeMo range is the WeMo Maker and Insight Switch. The Insight Switch (RRP \$99.95) works like the basic WeMo switch but has the added benefit of logging the power consumption of whatever is

plugged into it. For those comfortable with low-voltage electronics, or a specific thing they want available via the Internet, Belkin has the WeMo Maker (RRP \$149.95), which is essentially a relay that plays with the WeMo ecosystem. Hook up things like garden lights, garage doors, blinds, or even sensors to measure temperature or humidity.

What makes the WeMo so versatile is integration with a web service called If This, Then That (IFTTT). With IFTTT, all sorts of scriptable automation can occur and best of all, IFTTT is a joy to use and easy for everyone, no programming knowledge required. A tiny list of what IFTTT and WeMo integration is capable of include:

- Turning on a lamp at sunset.
- Geo-location based triggers (e.g: turn off something plugged into a WeMo when you leave the house).
- Turn a WeMo device on or off based on a specific list of dates and times.
- Toggle WeMo on or off when someone enters a room.
- Send notifications, Tweets or Facebook messages based on WeMo device activity.

There are thousands of combinations of IFTTT "recipes" that can have your WeMo device interact with other IFTTT enabled hardware and services such as Dropbox, Facebook, Google Calendar, Gmail and hundreds more. The only limit is your creativity.

Not everyone needs to automate the stuff in their home, or hook it up to the Internet, but if you've ever thought to yourself "yeah, it would be awesome if I could control that with my smartphone", then Belkin's WeMo range is easy to recommend. WeMo is simple to set up, If This Then That support works brilliantly, is well priced and a piece of cake to use.

Anthony Agius

KEY SPECS

\$69.95 for basic WeMo Switch

www.belkin.com.au/wemo

Wi-Fi enabled home automation with Android & iOS apps and If This Then That (IFTTT) support. Product range includes switches, LED bulbs, motion sensors, video cameras, light switches and low voltage relays.

OVERALL



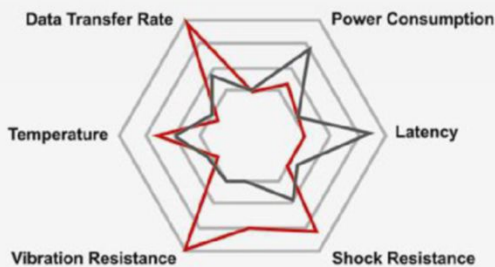
Apacer

Thunderbird

AST680S **SATA 3 6Gb/s SSD**



SSD ■ vs. HDD ■



S.M.A.R.T. commands

NCQ command

Compatible with
SATA6.0 Gb/s interface

Powerful ECC engine
correcting up to 72bit/1KB

Read/Write performance,
up to 550/520 MB/sec



SYD

J & W computers
<http://www.jwcomputers.co.uk>

MWAVE
<http://www.mwave.com.au>

MEL

PC CASE GEAR
<https://pccasegear.com>

Centre Com
<http://www.centrecom.com.au>

Scorpion
<http://www.scorpion.com.au>

QLD

Umart
<https://www.umart.com.au>

Computer Alliance
<http://www.computeralliance.com.au>

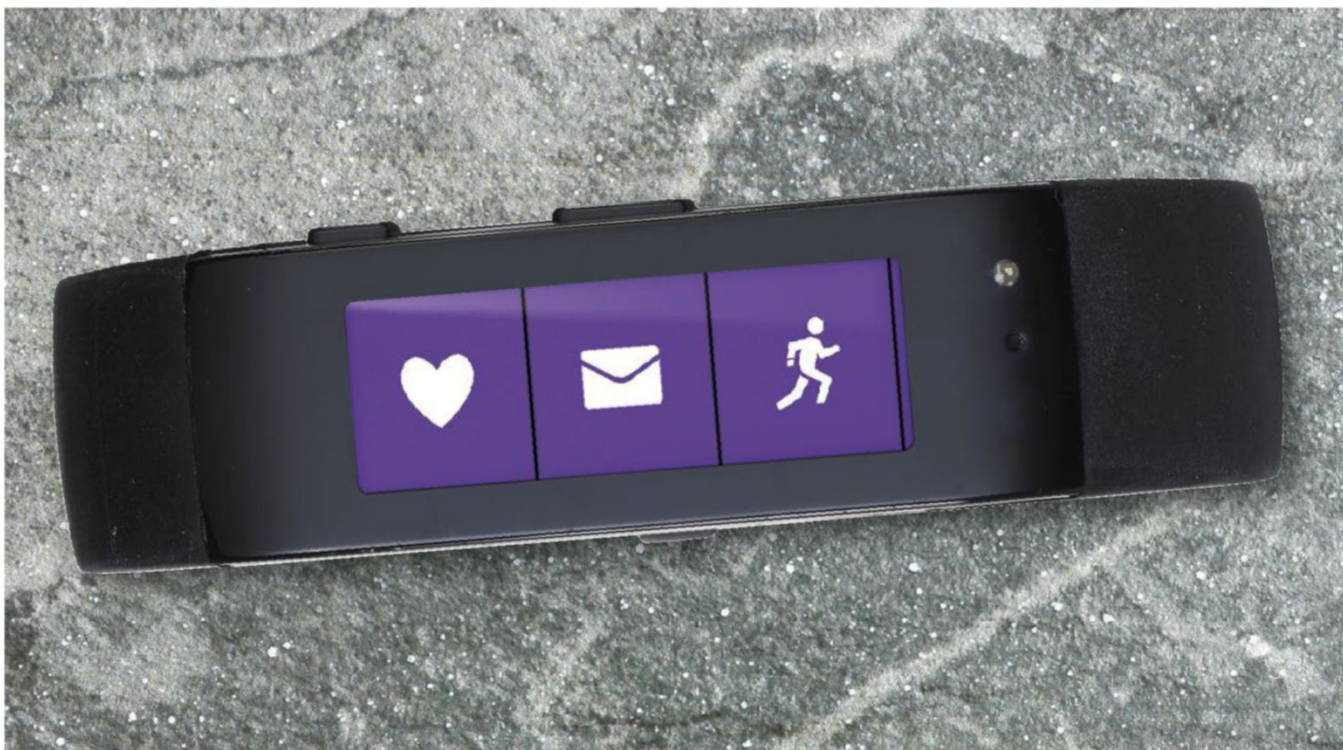
PERTH

PLE Computer
<https://www.ple.com.au>

New Zealand

Mighty Ape
<http://www.mightyape.co.nz>

Playtech
www.playtech.co.nz
Xpcomputers
<http://www.xpcomputers.co.nz>
Just laptop
www.justlaptops.co.nz



Microsoft Band

PACKED WITH PROMISE, BUT PERFORMANCE NIGGLES PREVENT IT FROM REALISING ITS POTENTIAL

One of the common frustrations with the fitness-tracking facilities in most smartwatches is that they simply don't do enough. That's not a problem for the Microsoft Band, which crams in almost every sensor that a fitness fanatic, or a keen beginner, could possibly ask for.

You get an optical heart-rate sensor, capable of continuously tracking your heart rate 24 hours a day; a built-in GPS receiver; a three-axis accelerometer; a gyrometer; and an array of sensors that measure ambient light, skin temperature, UV light and galvanic skin response. There's also a capacitive sensor, so the Band knows when you're wearing it.

The data pulled in by all these sensors allows the Microsoft Band to track every facet of your daily activities: how many steps you take, how many calories you burn, your heart rate, and even the quality of your sleep. Factor in the ability to display emails, calendar

events, text messages and social media updates on your wrist, and the Band is as multitasking as wearables come.

Design-wise, the Band is a curious mix of the functional and the downright ugly. Finished in matte black, with a glossy, rectangular 1.3in display in the middle of the strap, it's a plain-looking, utilitarian device – imagine a wristborne ASBO tag and you're halfway there. It comes in small, medium and large sizes, and a clicky ratchet mechanism makes it simple to adjust to your wrist. The compact design provides the option of having the 1.3in colour touchscreen face the inside or outside of your wrist.

While that display is small, its 106 x 320-pixel resolution produces sharp text and icons, and it's bright enough to remain legible on sunny days. A built-in light sensor means there's no need to fiddle manually with the screen brightness.

Thanks to an ARM Cortex-M4

processor, the Band's interface feels slick, and it's easy to use: tap the power button and the homescreen displays the time and a secondary statistic; tapping the action button cycles between steps taken, calories used, your current heart

“The Band is a curious mix of functional and ugly – imagine a wristborne ASBO tag and you're halfway there”

rate and the date. Swipe right from the homescreen and three little icons display the battery and Bluetooth status, and show whether the 24-hour heart-rate tracking is enabled. Swipe left and there's a sideways-scrolling list of tiles that provide access to all the various included “apps”.

When it comes to compatibility, Microsoft has it nailed: the Band works with Android 4.3, Windows Phone 8.1 and iOS 7.1 or newer. Uploading your step, exercise and sleep data is as simple as firing up the Microsoft Health app and syncing over Bluetooth. Only Windows



✓ As well as featuring numerous trackers, the Band can also display emails, text messages and more



Phone 8.1 devices with Update 1 installed get to take advantage of the Band's Cortana support, though.

Another nifty Windows Phone-only feature is the virtual keyboard: this places a tiny Qwerty keyboard on the screen and lets you tap out replies to text messages directly on the Band itself. Swiping left lets you switch between the different keyboard panels, while swiping right lets you check what you've already written in a message.

Inside the Microsoft Health app, you can keep track of your workouts, sleep quality and all the other data the Band has captured. It's incredibly simple to use, with recent activities summarised across a stack of rectangular tiles; tapping on each lets you dip into each discipline in more detail. This makes it easy to analyse weekly trends, track your heart rate and speed over the course of each workout, and get an overview of your recent fitness activities.

TESTING THE BAND

While the simplicity of the Microsoft Health app is great for beginners, more advanced users may be less enamoured. It's possible to connect to third-party apps such as RunKeeper, MapMyRun and Strava, but the Microsoft



Health app uploads only a summary of your exercise, rather than the full dataset. We were able to use the third-party unBand app to extract the data via GPX export, but it's hardly the most elegant solution.

The heart-rate monitor may not fully satisfy fitness fanatics either; sometimes we found its accuracy highly suspect. For instance, cycling flat out up a steep hill we saw our heart rate supposedly plateau at 150bpm, a figure that was clearly way too low for our lung-busting efforts.

We also observed a distinct lag in measuring heart-rate spikes, which will be a problem if you want to maintain an exertion level based on precalculated heart-rate zones. In short, as a workout companion, it doesn't quite make the grade.

Various design issues become apparent through use as well. The uncurved screen and bulging strap make it bulky by tracker standards. In everyday wear, it kept getting caught on our shirt sleeves, while the Sony SmartBand Talk or Samsung Gear Fit slipped neatly under the cuff.

During heavier workouts and

< The Health app shows simple summaries of your activity

extended runs or bike rides, we often found it necessary to adjust the strap: what starts as a snug, comfortable fit soon becomes overly tight once the blood starts pumping.

Other niggles include the absence of a vertical view, requiring you to twist your arm around awkwardly to read onscreen messages, or to glimpse at exercise-related data. Thanks to its small size, it's difficult to read while running, and nigh-on impossible to read safely while rattling along on a bike.

A final disappointment is that the Band is only splash- and sweat-resistant. We got thoroughly soaked on one bike ride and, while the Band survived the ordeal, the heart-rate sensor stopped working for the duration of the downpour.

Battery life, at least, is decent. It takes only around 35 to 40 minutes to top up the Band's battery to 80%, and a full charge – with the display set to automatically time out – gave us well over a day's use, including four hours of GPS-tracked cycling, event notifications and a whole night of sleep tracking.

VERDICT

We had high hopes for the Microsoft Band: with every sensor under the sun packed in for a reasonable US\$199, it looked like it might consign all our other exercise devices to the scrap heap. And it certainly has plenty to offer: we loved the guided workouts and workout plans, which could be just the push an aspiring athlete needs to get out there and get fit. The simplicity of the interface and partner app are certainly appealing, and it's great that you're not tied to a particular smartphone platform.

Frustratingly, though, the Band falls short of its potential. The design needs to be more comfortable, and the display more legible; the heart-rate monitor needs to be more accurate, and official support for full data export is a must for switched-on fitness enthusiasts. With a few future updates, Microsoft isn't far from acing the fitness-tracker formula – but for now, you'll need to forgive its limitations. It's good, but it could be so much better.

Sasha Muller

KEY SPECS

US\$199 • www.microsoftstore.com
1.3in 106 x 320 touchscreen • GPS • optical heart-rate sensor
• Bluetooth 4 LE • 60g • 1yr RTB warranty

OVERALL



< The simple ratchet mechanism allows you to easily adjust the Band to your wrist



Huawei P8

GREAT DESIGN, A SUPERB CAMERA AND A DECENT SCREEN - ALL FOR LESS THAN YOU MIGHT THINK

Last year, Huawei's Ascend P7 smartphone impressed us with its slimline good looks and top-quality camera – but it was undermined by sluggish performance and an over-fussy UI. This year, the company aims to improve on that with its new flagship.

First impressions are positive. The P8 is super-slim, measuring a mere 6.9mm from front to back; it weighs only 144g, and it looks great. The curved edges contrast pleasingly with the flat front and matte-finish rear, and the bevelled edges give it an expensive look that's redolent of the Samsung Galaxy S6 – even though the P8 is considerably cheaper.

In a couple of areas, the P8 even trumps the S6. Although there's no removable battery, the P8 has a microSD slot for storage expansion. It's water- and dust-resistant too, and the camera doesn't protrude at the rear.

The only major downside is a lack of Gorilla Glass on the front; in time the P8 could scuff more easily than its pricier rivals, although so far we've seen no evidence of that.

Round the back, the 13-megapixel camera brings a few innovations. They start with the "world's first" four-colour sensor, using a unique RGBW pixel arrangement that Huawei claims captures more accurate colours than a traditional RGB sensor.

The camera also has its own image processor, which is said to deliver improved scene recognition and more balanced exposures. It's accompanied by optical image stabilisation and a dual-LED flash, plus there is an 8-megapixel front camera.

The results are impressive. The camera is quick to open, focus and shoot – and quality is fantastic, particularly in low light. Thanks to the wide f/2 lens and optical stabilisation, it's possible to take sharp handheld shots at shutter speeds as low as 1/4sec.

✓ The camera includes a four- as opposed to three-colour sensor



▲ The P8's 1080p screen is bright and delivers excellent viewing angles

In good light the camera dealt well with even tricky scenes, retaining detail in bright skies without losing detail in the shadows. Video was crisp and rock-steady in all but the most extreme situations.

Our only gripes were that, under certain conditions, pictures look slightly washed out – and there's no 4K video capture.

Core components comprise an octa-core HiSilicon Kirin 930/935 processor with twin quad-core CPUs running at 2GHz and 1.5GHz respectively. There's 3GB of RAM, a Mali-T624 GPU, and either 16GB or 64GB of storage, depending on the model you choose.

In use it feels nippy – much more so than last year's P7 – but benchmarks reveal that the P8 isn't quite in the same league as top-end phones such as the HTC One M9 and Samsung Galaxy S6. Pure number-crunching is pretty strong, with Geekbench 3 results only a touch behind the HTC One M9, but a frame rate of 18fps in the GFXBench T-Rex HD test is a long way behind the M9's 49fps.

And, despite the 2,680mAh battery, longevity lags too. With hardly any gaming and only a modicum of web browsing and photography, we found the P8 needed recharging every evening, where a Sony Xperia Z3 or Samsung Galaxy S6 would have comfortably lasted into the second day under similar use. In our battery tests, we found video

playback depleted the P8's capacity at a rate of 14.9% per hour, and audio streaming used it up at 6.9% per hour – distinctly faster than rivals.

The P8 does benefit from a decent 1080p screen. Brightness is fine, reaching 419cd/m² at maximum settings, and viewing angles are excellent. IPS-NEO technology delivers a contrast ratio of 1,461:1 – higher than normal for IPS panels. Colour accuracy isn't great, though, which leaves the P8's overall visual impression lacking the impact of phones such as the Samsung Galaxy S6.

As usual with Huawei devices, the P8 comes loaded with novelty add-ons, including a crazy feature called "knuckle sense", which allows you to capture a screenshot with a tap of your knuckle. In truth, we could do entirely without Huawei's heavy-handed Emotion UI, which in our view doesn't improve Android 5.0.2 at all.

There are some useful voice-call features however, including wind-noise reduction for clearer calls, automatic microphone sensitivity and earpiece volume control. We had no complaints about call quality indoors or out, although speakerphone calls had an unpleasant scratchy quality when we turned up the call volume.

The P8 isn't a match for the very best smartphones we've seen. The Samsung Galaxy S6 remains secure on its throne at the very top, while the HTC One M9, Sony Xperia Z3, Nexus 6 and Apple iPhone 6 also outclass the P8's battery life and graphics performance. That could perhaps be forgiven if the price were competitive, but unfortunately the P8 isn't quite cheap enough to excuse its shortcomings.

If you value camera quality above all else, then the Huawei P8 is worth a look – but we'd suggest you weigh up alternative options, such as the Samsung Galaxy S5, which is cheaper SIM-free, or the Galaxy Note 4, which can be had for around \$630, before taking the plunge.

Jonathan Bray

BATTERY LIFE



KEY SPECS

\$760 (32GB), **\$900** (64GB) • www.huawei.com.au
Octa-core HiSilicon Kirin 930/935 CPU • ARM Mali-T624 GPU • 3GB RAM • 16/64GB storage • 5.2in 1,080 x 1,920 IPS display • dual-band 802.11n Wi-Fi • 2,680mAh battery • Android 5 with Emotion UI • 13MP rear/8MP front cameras • 1yr RTB warranty • 72 x 6.9 x 145mm | 144g

OVERALL



Adobe Photoshop Lightroom 6

A LONG-AWAITED UPGRADE THAT ADDS NEW CREATIVE OPTIONS TO AN ALREADY WELL-STOCKED TOOLBOX

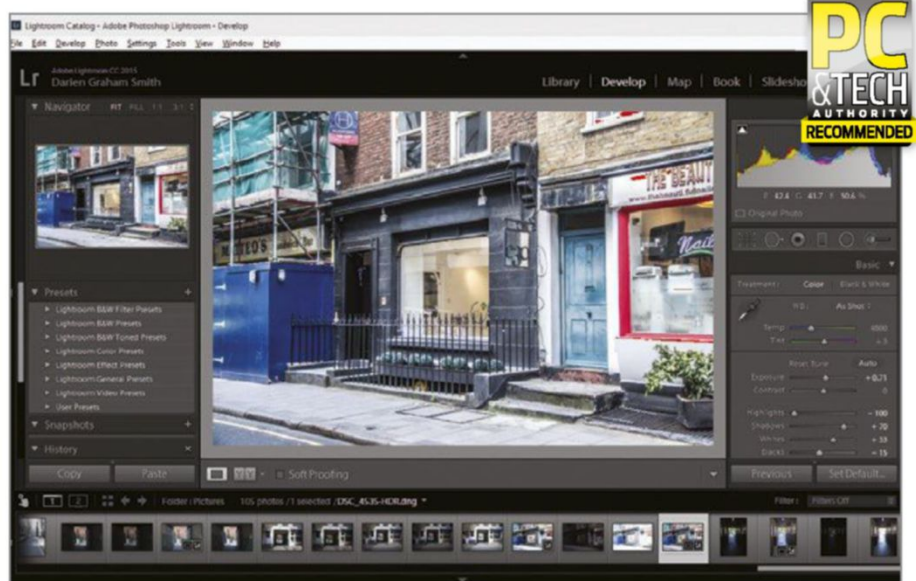
Nearly two years following the release of Lightroom 5, Adobe has rolled out a major new update to its photographic workhorse. We say "rolled out", because if you subscribe to Adobe's Creative Cloud Photography plan, the new version is available to download already (under the name Photoshop Lightroom CC). Happily, photographers who prefer a perpetual licence are catered for too, with a standalone edition offered as a US\$149 upgrade for existing users.

Whether it's a particularly worthwhile upgrade depends on your ambitions. The underlying image-processing engine hasn't changed, so if you're happy with Lightroom 5, the new version won't make your photos look any better. It does, however, open up new creative options, not least with a pair of photomerge tools that lets you stack and blend images into HDR and panoramic scenes.

At first glance, these look basic. Where Photoshop's HDR Pro module gives you extensive control over the tone of your merged image, here you get only a few tickboxes and a choice of four dehazing levels. Of course, this is Lightroom, so if the combined image doesn't have the desired HDR glow, you can always apply non-destructive processing to perfect it after the fact. It's just a shame that the merge module produces only 8-bit DNGs: a 16-bit option, as found in Photoshop, would have left you more subtle tonal detail to work with.

LIGHTROOM MOBILE

For Creative Cloud users, Lightroom's companion app – released last year on iOS – is now available on Android too. Limited storage and processing power mean the mobile app can't offer the full range of processing and library-management tools, but editing, presentation and cropping capabilities have all been upgraded in this edition. It's an agreeable way to review a shot and apply preliminary processing before you get back to your PC.



▲ The new HDR function automatically merges bracketed shots into a new DNG

It's a similar story with the panorama feature. On opening the preview window you'll see few options: just three projections and an auto-crop tool. You can't even zoom into the preview to check for boundary mismatches – although that's perhaps academic, since there are no tools for fixing them. Thankfully, our results proved consistent, with even quite widely spaced shots stitching seamlessly together: only in one case did we need to export the image into Photoshop to tidy up a glitch. Again, the output is a DNG, so you can use Lightroom's processing tools to non-destructively punch up the resulting image.

Also new in Lightroom 6 is GPU acceleration, and with our Intel HD Graphics 4400 GPU the Develop stage certainly felt more responsive than in the previous edition. Make no mistake, though, photo-editing is still a weighty business. On our Core i7-3770S test system, it still took three to four seconds for our 24-megapixel raw images to render at full zoom. Creating an HDR preview from three bracketed images took 52 seconds, and a further minute for the final render. A nine-photo panorama took almost six minutes to appear, slowing the rest of the system to a crawl.

In fact, it might be Lightroom 6's more minor upgrades that have the biggest impact on your day-to-day workflow. An inconspicuous update to the Graduated

and Radial Filter tools now lets you edit their adjustment masks with a brush. This means you can easily – for example – drag down a graduated filter to add depth and vibrancy to a drab sky, then manually mask out any protruding trees and buildings, to restore their natural exposure and tone.

Another easily overlooked addition is automatic facial recognition, and the accompanying "Find similar faces" function. More commonly associated with the likes of Picasa and Facebook, it's a feature that may seem superfluous to serious snappers – but for those who cover weddings or celebrity events, it could be a tremendous time-saver.

In itself, Lightroom 6 doesn't add up to a revolutionary update, but it improves on what was already an exceptional piece of software. While the new HDR and panorama capabilities are currently a bit basic, it's inspiring to have the options at your fingertips – and we suspect a fair few switchers will soon be wondering how they ever got by without editable filter masks and the new facial-recognition tools. Stack Lightroom 6 next to the price of a new lens, or even a new filter, and it's an easy upgrade to justify.

Darien Graham-Smith

KEY SPECS

US\$49 · www.adobe.com/au

OVERALL



Ubuntu 15.04

UBUNTU IS AS CAPABLE AS IT EVER WAS, BUT THIS UPDATE ADDS NOTHING OF REAL SIGNIFICANCE

If it's spring, that must mean a new release of Ubuntu. This latest one is codenamed the "Vivid Vervet", but – as has become common for Ubuntu releases – you'll have to squint to spot the difference between this and last autumn's "Utopic Unicorn".

In fact, Ubuntu 15.04 raises the bar when it comes to inconspicuous updates. From a user perspective, the only noticeable change is to application menus, which now appear in their respective windows rather than at the top of the screen. Such behaviour has been optional since 14.04 – and indeed was the default in Ubuntu 10.10 and before – so as user-experience updates go, this isn't exactly a brave new world.

There are bigger changes to be found beneath the surface of Ubuntu 15.04. Internally, Canonical's Upstart system (which launches jobs and services) has been replaced by systemd, following the latter's acceptance into Debian, on which Ubuntu is based. Desktop users shouldn't notice any difference, but administrators will need to get to grips with systemd's more complex way of doing things – you'll find a guide to switching at tinyurl.com/jwtekbfb.

The Linux kernel has been updated to version 3.19.3, bringing improved support for IPv6 and various hardware driver updates. Unfortunately, kernel 4 arrived too late in the Ubuntu development cycle to make it into this release – a shame, since in addition to even newer drivers,

it adds the ability to patch the kernel without rebooting the system.

And that, in the standard distribution, is pretty much it for updates. Of course, Ubuntu still has its numerous variant "flavours" such as Kubuntu, Xubuntu and so forth – as well as the newly approved Ubuntu MATE distribution, based on the friendly MATE desktop – which may bring their own interface tweaks. Inescapably, though, the base Ubuntu 15.04 release feels like a non-event.

That isn't necessarily a criticism of the platform as a whole. Ubuntu is as capable and accessible as it ever was, and free. But it's hard not to feel a touch of dismay at the apparent lack of progress on show, especially in light of all the ambitious talk that's been coming out of Canonical in the past few years. Originally, Ubuntu was supposed to be using the brand-new touch-friendly Unity 8 desktop by now, running on Canonical's homegrown Mir display server. But long delays have left both upgrades years behind schedule; the new front-end isn't now expected to be properly ready for a stable desktop until 2016 (if you want to try it out before then, use the daily "Desktop Next" preview image from tinyurl.com/nhthwb).

Then there's the much-touted idea of convergence, which integrates the desktop OS with the smartphone-orientated distribution. When first floated in 2012, this sounded like an idea that could have propelled Ubuntu into the mainstream, and it was supported by big



Canonical's online documentation welcomes beginners to the Ubuntu desktop online content

plans for tablets and smart TVs. Again, though, the reality has been less rosy: in 2013, the Ubuntu Edge smartphone that would have been Ubuntu's first flagship fell well short of its crowdfunding target and was axed. Two years on, there's just one consumer Ubuntu smartphone available, while tablets and TVs haven't even got that far.

How much this matters is an open question. Ubuntu isn't driven by profit, so it doesn't need to chase market share, or indeed relevance. However, as big plans have faltered, and innovation on the desktop OS appears to have ground to a halt, the scent of stagnation has started to hang around the platform.

Perhaps that's a sign that it's time for Canonical to take the opposite tack to Microsoft and move to less frequent releases, or at least less arbitrarily timetabled ones. Ubuntu is stable enough now not to need constant updating, and in this case waiting on the Linux 4 kernel would have made for a much more compelling release. Canonical's engineers, meanwhile, could benefit from spending more time working on long-promised upgrades, and less time patching and polishing half-baked versions of things for a biannual release.

If you're looking for a free, friendly and powerful OS for desktops and servers, Ubuntu is still an easy Linux distribution to recommend. But even for established Ubuntu users this update is neither practically nor emotionally compelling. If Canonical seriously wants Ubuntu to make more of a mainstream impact, Ubuntu 15.04 – a barely necessary update rolled out to serve a timetable rather than a strategy – is precisely the sort of thing it needs to stop releasing.

Darien Graham-Smith

The Ubuntu Dash still combines local search results with a variety of online content



KEY SPECS

\$free- www.ubuntu.com

OVERALL





Microsoft Office 2016 IT Pro and Developer Preview

MICROSOFT'S FIRST PUBLIC RELEASE OF OFFICE 2016 SEES SOME WELCOME UPDATES - AND THERE'S MORE TO COME

These days, any update to Office must inevitably seem quite minor – after all, the major features have been fully formed for years. So it is with Office 2016, now available as an “IT Pro and Developer Preview” for Office 365 subscribers. But incremental improvements are no bad thing: if Microsoft had rested on its laurels after Office 97, we’d have no ribbon interface, no Backstage view or OneDrive integration – and we’d still have Clippy.

One key addition to Office 2016 could change the way you use the suite: desktop applications have now inherited the “Tell me what you want to do...” search box from the Office online applications.

Once you start using this simple feature, you’ll be wondering why Microsoft didn’t build it in years ago. The ability to hit Alt+Q and simply type what you’re looking for – be it sparklines in Excel, drop-caps in Word or animations in PowerPoint – is a huge usability boost. Although the ribbon

was originally intended to help users find the functions they were looking for, we’ve often found it frustrating to have to hunt for features we don’t commonly use. That frustration is now gone.

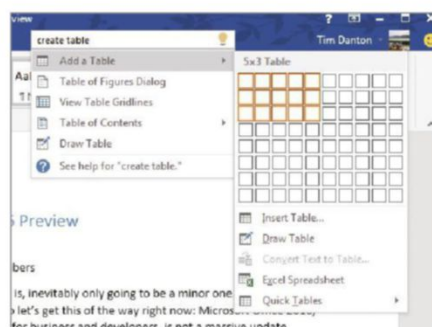
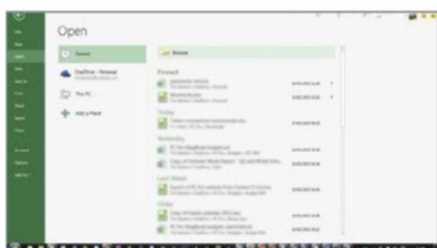
The search facility doesn’t merely signpost the feature you want – it lets you use it directly. Type “table” into the box in Word and a dropdown appears offering all the functions of the ribbon bar button. Want to insert a bar chart in Excel? Select your cells, type “chart” in the box, and select a chart type from the dropdown.

The new search field isn’t currently in Outlook or Access – but in time we hope it will become as pervasive as the ribbon.

Cosmetically, Office 2016 is more colourful than Office 2013, with the toolbars adopting the colour coding of their logos: Word has a blue toolbar, Excel’s is green, PowerPoint’s is red and

✓ The new search box affords direct access to Office’s many tools and features

✓ Folder icons in Excel’s Backstage view have been updated



so on. It isn’t a huge change, and the old colour schemes are still available, but we find the new look makes it easier to make sense of a crowded desktop.

Elsewhere, the Backstage view gets updated folder icons, and a re-organisation that sees the Browse button always displayed at the top of the screen. It’s cleaner than it was, but we’d have preferred to see a more drastic redesign: this area has always seemed a bit of a hotch-potch rather than a properly thought-out interface.

Additionally, in Outlook 2016, when you click “Attach file”, a list of recently accessed files now drops down. You can select Browse to pick any file you like, but if you’ve recently used a document you want to attach, it’s accessible with a single click.

Office 2016 brings several improvements for corporate users. Word, Excel and PowerPoint now get data-loss-prevention features, which IT administrators can use to prevent employees leaking sensitive company information accidentally (or indeed deliberately). Similarly, Visio now supports Microsoft’s Information Rights Management (IRM) tool, which can help companies control the way files are used after they’re sent elsewhere, such as by restricting pasting or printing.

In Outlook, RPC synchronisation is replaced by the newer MAPI-HTTP protocol, so emails should arrive more quickly, and more reliably on unstable connections such as 3G links. Those on tablets or lightweight laptops will be glad to learn that you can also now restrict the local storage of email to one, three, seven or 14 days.

Finally, deployment options have been upgraded: IT admins can now manage Office 365 subscriptions on devices remotely from the Office Admin Portal.

It’s early days, but already we’re finding Office 2016 easier to use than its predecessor, better looking and better equipped for modern business. It remains to be seen what else will be added before the software officially hits later this year. Microsoft plans to keep adding features to the preview via monthly updates.

Jonathan Bray

HOW TO GET THE PREVIEW

If you’re an Office 365 subscriber, you can sign up to the Office 2016 preview at tinyurl.com/ooo7sap. Needless to say, all the usual caveats concerning preview software apply. Non-subscribers can also sign up and download the software – but you won’t be able to activate it, so you may only be able to try it out for 48 hours.

Labs Briefs

D-Link Portable Digital TV Receiver

\$55 • www.dlink.com.au

Despite the billion amazing things a smartphone can do via apps and the internet, there's still something magical about watching TV on your phone. D-Link's little dongle is a digital TV receiver and antenna, and with its app installed delivers TV just as the box says. Step 1 is to scan channels, step 2 is to watch. Easy. We picked up all the free to air channels and image quality is exactly as you would see on a big screen TV, but even crisper thanks to the small screen size.

Reception needs to be perfect and consistent, so forget about this as commuter entertainment. What looks like a wristband is actually an antenna. It finds a signal well, but starts to lose it if moved about too much, or into some invisible black spot. Obviously this doesn't need one bit of internet data, so if it's working for you this is literally free TV (purchase price not included) in the palm of your smart hand.

Ben Mansill

OVERALL



Bose QC 25

\$399 • www.bose.com.au

The new QC25's easily fulfil the primary noise cancellation function. Bose has been at this long enough to get that right. While peaky noises will still infiltrate, the soft white noise of an aircraft engine, or distant babbling audio clutter of an office are effectively reduced to near-nothing. There's still the odd change in ear pressure when you engage noise cancelling, but it's not as tiring as many other brands. A switch on the side of one cup turns it on or off, and music will continue to play with it disengaged, though it appears that internal amplification is at play – everything sounds better with noise cancelling on, even if you are sitting in a silent room.

They're super comfortable, and light, easily long-haul flight-worthy. Alas, the power source is a non-rechargeable AAA battery, we'd certainly have preferred a rechargeable pack as found on other Bose noise cancelling cans.

Ben Mansill

OVERALL



G Drive ev Raw

\$199 (1TB), \$179 (500GB)
www.g-technology.com

It's been a long while since we tested a G-Technology drive, but the company has been working hard and sports a good range of storage solutions. The G-Drive has two party tricks. The first is it's ruggedized, boasting a 1.5m safe drop height onto carpet, and 1.2m onto concrete. We tested both heights, then doubled it, then tripled it. The G Drive fought on bravely with no issues reading the data whatsoever.

The chunky rubbery shell is clearly doing its job. Slip the rubbery bit off, and the hard plastic case is sized to fit into the company's Evolution Series NAS bay, or just use it as a regular portable drive. It's got a USB 3 interface and street prices are a good \$50 or more below the RRP above.

Ben Mansill

OVERALL



Samsung T1 SSD

\$269 (150GB); \$429 (500GB); \$799 (1TB)
• www.samsung.com.au

We've looked at portable SSDs before, such as the Corsair Flash Voyager GTX, and the Samsung T1 brings nothing new to the offering – other than Samsung's classy style, and the company really is at the top of the game with that. The T1 has been designed to be a lot larger than it needs to be to actually house the components inside. But what you get is a lovely looking thing that looks terrific and probably more importantly is just large enough to not easily get lost, yet is easily pocketable, and oddly people are drawn to it and want to hold it. So good job there, Samsung.

The interface is USB 3, and you can expect read and write speeds of up to 450MB/s. On our test rig we recorded just under 430MB/s, but mileage varies according the system it's connected to.

Ben Mansill

OVERALL



Mophie Juice Pack Air

\$129.95 • www.mophie.com

It's a 2750mAh battery pack for your iPhone 6. It's well designed. It feels good in the hand with that special kind of rubberised plastic that feels great and has actual utility because it's grippy.

The charging mechanism is digitally controlled and has a pass through function, so it will charge up your iPhone's battery first, then itself. Data is also passed-through. It offers a measure of drop protection, too, and adds less bulk overall than some other battery packs we've tried. It's a bit on the pricey side, but it's quality gear and won't hurt your iPhone's good looks, much, either. The company has similar cases for popular handsets, including the Galaxy 6, which boasts a 3,300mAh battery.

Ben Mansill

OVERALL



Sound Blaster E5

\$299.95 • au.creative.com/p/sound-blaster/sound-blaster-e5

A small portable headphone amplifier and DAC with built in features for audio recording or chat, the Sound Blaster E5 is a small device that tries to be a Jack of all trades and masters most of them.

Roughly the size of a portable hard drive, the E5 can be used much like an external soundcard for PCs, notebooks, tablets and phones, delivering the highest possible quality audio from the source material.

The unit has a stereo mic input as well as three integrated mics for use in voice chat or recording. Sound Blaster has a legendary name in gaming circles and that legacy is still present in the E5, with OpenAL and EAX 5.0 compatibility and a software suite that contains CrystalVoice FX for real time chat effects and Scout Mode to highlight footsteps and in game directionality. It's a great unit, but you definitely have to pay through the nose for it.

Daniel Wilks

OVERALL



Supermicro GS50 Gaming Chassis

\$120 • www.bios-it.com.au

For a first effort in the consumer space, server rack maker Supermicro has delivered a pretty reasonable case. It's very well put together, which you'd expect from a rack maker, with solid power and reset buttons, and is very versatile. There's a big stack of removable drive caddies, that can be removed to make room for larger components like video cards, and the optical drive bays are actually extra caddies themselves, not just empty bays fronted by face-plates.

While the exterior is quite well-designed, the interior is raw metal, with a few raw and sharp edges. There's three fans as stock, and room for more, with removable dust-filters top and bottom. It's not the most flash chassis on the market, but it's certainly a good first statement.

David Hollingworth

OVERALL



MSI Panocam

\$279.000 • <http://somethings.msi.com/>

The 360 Panocam can remotely connect to a smartphone or computer and monitor a given area. The Panocam's generous fisheye lens gives a wide, 360 degree viewing angle, and includes a digital zoom function. The viewing angle can also be adjusted to any plane, and the camera bolted to a surface, such as facing down from a ceiling to view a whole room, or placed upon the included soft rubber pad which comes with the Panocam to help it lie still.

Finding and pairing the camera to an Android smartphone (iOS also supported) required multiple attempts via an odd tonal link up, with the phone and camera awkwardly sharing an audio handshake. For something which has Wi-Fi connectivity, using such a finicky audio-recognition system seems misplaced.

It's around the same price as its competition, but perhaps the unique form factor offers something extra.

Alessandro Guarrera

OVERALL



Mainstream LAPTOPS

WHAT DOES \$1200 - \$2000 BUY YOU IN
THE WORLD OF MAINSTREAM LAPTOPS?
BENNETT RING STACKS UP THE CONTENDERS.



Sales of laptops in Australia continue to grow at a healthy rate, outpacing the likes of desktop and corporate PC sales by a healthy margin. With manufacturers all vying for a piece of the mobile pie, consumers are spoilt for choice, with a massive range of competing laptops across several distinct categories. From high-end gaming behemoths, to ultra-portable convertibles that can happily hide inside a handbag, there are now more types of laptops than ever. But sometimes all someone wants is a basic, no-frills laptop to handle the basics; web browsing, word processing, spreadsheets and email. It's easy to forget that these types of laptops exist, as we're tempted by the flashy features of the expensive laptops, which many of us arguably don't even need. PC & Tech Authority is guilty of this too – it's always more exciting to review a laptop that can crush today's games, or converts into 47 different shapes, than a plain Jane productivity laptop.

We've had many requests from readers to cover some



of the everyday products that often get overlooked, which is why we're presenting the PCTA Mainstream Laptop roundup for you in this issue. What follows are six of the most affordable yet capable laptops on the market. They might not be flashy or sexy, but they handle the basics with aplomb.

BUYING A MAINSTREAM LAPTOP

When buying a jack-of-all-trades laptop, the first thing to decide is the size and weight. If you're going to be lugging it around all day, opt for a smaller, lighter model, but be aware that performance and features will likely suffer as a result. If you're going to use your laptop as a desktop replacement, a larger display will make using it that much easier on the eyes. Check that your potential laptop has enough inputs and outputs to handle the peripherals you need to use.

Most laptops around this price range have very similar internal components, though as you'll see in the following reviews some do have superior performance at specific tasks, such as general office duties. Finally, make sure the laptop you're interested in fits your budget. As for warranties, Australian consumer law ensures Aussies are covered by legal warranties that tend to be much longer than the year or two offered by manufacturers, so don't be put off by a

M.I.A LAPTOPS

Not every brand is represented here, despite our efforts. Sadly an Acer Aspire R14 laptop went missing in transit and couldn't be located in time to include. HP sent a laptop, and after we had completed testing and had written the review an HP product manager realised we'd been sent an end of life model that was no longer being sold here, so we had no choice but to delete that one from the round up. Others either declined to participate, or had no products that fell within our \$1200 - \$2000 range. Note too, that we chose to review regular laptops, so no 2-in-1's are included in this group test.

laptop that only comes with a short manufacturer's warranty.

CONCLUSION

There are plenty of capable laptops in the mainstream price bracket, but we have to pick Apple's new MacBook as our favourite when it comes to sheer sex appeal and portability. If you're looking for blazing performance, MSI's new PE60 thrashes the competition with its high-end hardware, while Toshiba's P50W delivers a range of functionality that the others lack. For a budget machine that is as powerful as it is portable, Dell's cute little XPS 13 has a lot to offer.

	Dell XPS 13	Lenovo ThinkPad T550	12 inch Apple MacBook	Asus Zenbook UX305	MSI PE60-111AU	Toshiba P50W
OVERALL	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
Website	www.dell.com.au	www.lenovo.com.au	www.apple.com/au	www.asus.com.au	http://au.msi.com	www.mytoshiba.com.au
CPU	Intel i5-5200U (2 Cores, HyperThreaded, 2.2GHz base, 2.7GHz Turbo)	Intel i5-5200U (2 Cores, HyperThreaded, 2.2GHz base, 2.7GHz Turbo)	Intel Core M 1.3GHz, 2.9GHz Turbo	Intel Core M-5Y71 (2 Cores, HyperThreaded, 1.2GHz base, 2.9GHz Turbo)	Intel Core i5-4210U (2 Cores, HyperThreaded, 2.9GHz base, 3.5GHz Turbo)	"Intel Core i5-4210U (2 Cores, HyperThreaded, 1.7GHz base, 2.7GHz Turbo)"
GPU	Intel HD Graphics 5500	Intel HD Graphics 5500	Intel HD Graphics 5300	Intel HD Graphics 5300	NVIDIA GTX 950M	Intel HD Graphics 4400
Memory	8GB DDR3 1600	4GB DDR3 1600	8GB DDR3 1600	4GB DDR3 1600	8GB DDR3 1600	8GB DDR3 1600
Hard Drive 1	256GB SSD	500GB Hybrid Drive	256GB PCIe SSD	256GB SSD	128GB SSD	1TB 5400RPM Hybrid HDD
Hard Drive 2	n/a	n/a	n/a	n/a	1TB 7200RPM HDD	n/a
Optical Drive	n/a	n/a	n/a	n/a	Super Multi	Blu-ray burner
Screen Size	13.3"	15.6"	12"	13.3"	15.6"	15.6" Touchscreen
Screen resolution	1920 x 1080	1920 x 1080	2304 x 1440	1920 x 1080	1920 x 1080	1920 x 1080
Wi-Fi	802.11ac/a/b/g/n	802.11ac/a/b/g/n	802.11ac/a/b/g/n	802.11ac/a/b/g/n	802.11ac/a/b/g/n	802.11ac/b/g/n
Connectivity	HDMI, 2x USB 2.0, 2x USB 3.0 Ports, Audio Line In, Line Out, eSATA/USB Combo, DisplayPort	3 x USB 3.0 (one AlwaysOn), Combo audio/microphone jack, Ethernet (RJ45), 4-in-1 card reader (MMC, SD, SDHC, SDXC), Smart Card Reader (optional), Dock connector, VGA, Mini DisplayPort	USB-C, USB 3.1, DisplayPort 1.2	3 x USB 3.0, micro HDMI, SD card slot, headphone/microphone combo jack	SD(XC/HC) Card reader, Gigabit LAN, Wireless LAN 802.11ac, Bluetooth v4.0, HDMI 1(v1.4) support 4K output, 1 USB 2.0 port, 3 USB 3.0 ports, 1 Mini-DisplayPort support 4k 60Hz output FHD 120Hz output, Mic-in/Headphone-out 1/1	1 x microphone input / headphone output, 1 x HDMI with 4K Ultra HD, 2 x USB 3.0, 1 x USB 3.0 with USB Sleep and Charge, UHS-II SD, SDHC, SDXC, Mini SD, Micro SD, MMC card reader
Weight	1.18kg	2.13kg	0.92kg	1.2kg	2.4kg	2.35kg
Warranty	1 year	3 years	1 year	1 year	2 years	1 year
Price	\$1,499	\$1,749	\$1,799	\$1,399	\$1,999	\$1,599



Apple Macbook 12 inch

STUNNING TO BEHOLD

The latest version of Apple's insanely popular MacBook range has finally landed, and it's bound to divide opinions. It's expensive, has limited connectivity options and one of the most interesting keyboards we've seen on a laptop, which some will love, and others will hate. But it's also beautiful, and light, and a sign of things to come. Whether or not it's the right laptop for you will very much be determined by whether you're happy to handle its many limitations in exchange for such an iconic product.

At just 920 grams, this is one of the lightest mainstream laptops on offer. In fact, it's even lighter than the MacBook Air, which is supposed to be Apple's ultra-portable range. It's incredibly thin, measuring a mere 13mm at its deepest point, and the twelve inch screen means it's also rather narrow. As usual, it's built from Apple's brilliant aluminium chassis, giving it a sturdiness that other laptops

in this price range can only aspire to. It's now available in three colours – the usual silver, as well as gold and space grey.

Due to the extremely thin nature of the chassis, the range of input and output options is almost non-existent. A single USB 3.1 port is included, of the brand new C variety. Yep, just one USB port, and it's so new that none of your existing USB devices will work with it unless you can find a USB C adaptor. This fact alone will deter those with a fetish for adding additional devices, yet many users won't find this to be an issue. The inclusion of Bluetooth 4.0 and 802.11ac Wi-Fi means it's possible to connect most new devices wirelessly. A single stereo headphone output takes care of audio duties.

Despite the small dimensions, Apple has managed to cram a full-sized keyboard into the MacBook, and it stretches all the way to each edge of the bottom half of the laptop. However, due to the shallow base, Apple has had to redesign the mechanism behind each key, and it came up with a design it calls a butterfly spring. It's extremely odd to use, at least at first. Each key barely has any travel when pressed; it's only when you see the key stroke show up on screen that it registers that you have actually pressed the key. Frankly speaking, it feels horrible at first, but after a day or two typing becomes natural and speedy.



The touchpad has also been given an overhaul, and features the new Force Touch trackpad. This can measure how hard your fingers are pressing on the pad, which can be used to increase the thickness in drawing programs. It's also able to process a range of gestures for use as shortcuts within a range of Apple programs. Even the simple act of clicking has been redesigned, with clicks now registering anywhere on the touch pad.

The Retina display crams in a heady resolution of 2304 x 1440 pixels into the twelve inch display, making it incredibly crisp and clear. The 178 degree viewing angle suggests it's an IPS display, and both colour and contrast performance are spot on.

Unfortunately we couldn't benchmark the MacBook, as it's not compatible with our PCMark suite, but compared to other laptops the hardware within isn't exactly mind-blowing. An Intel Core-M CPU is included, though Apple don't state what model it is. The version in our model runs at 1.1GHz, boosting to 2.4GHz when the going gets tough. It's passively cooled, so the laptop remains whisper quiet no matter how hard you push it. 8GB of DDR3 1600 memory is also included, along with a 256GB PCIe SSD. Despite it not being top-tier hardware, this combination delivers extremely smooth and responsive performance, an incredible feat considering just how small the overall chassis is.

Whether or not the new MacBook is for you will come down to two key decisions. Firstly, does the iOS ecosystem deliver for all of your needs? If so, you'll then need to decide if the lack of connectivity and divisive keyboard design are worth the accompanying increase in mobility offered by such a small and light product. There's also a third question to answer – is your laptop as much a fashion accessory as it is a way to get work done? If the answer is yes, then the MacBook has no rival.

KEY SPECS

\$1699 • www.apple.com/au

Core M 1.1GHz • 12" Retina display (2304 x 1440) • Intel HD Graphics 5300 • 256GB SSD • 8GB DDR3 1600 • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: **N/A**

Office Accelerated Benchmark: **N/A**

OVERALL





Asus ZenBook UX305

ULTRAPORTABILITY COMES AT A PERFORMANCE PRICE

Apple's sexy new MacBook has a couple of competitors in Windows land, and the first is the ZenBook UX305 from Asus. It offers much of what makes the MacBook so special – ultra-thin, ultra-light, and a rather sexy design – without the limitations faced by prospective MacBook owners. Yet it's also lacking that special something, the secret ingredient, which makes Macs so different from most Windows laptops.

At just 12.3mm thick at its deepest point, the ZenBook is even thinner than the new MacBook. However, it's around 20% heavier, tipping the scales at 1.2kg, likely as a result of the additional componentry found throughout. The chassis appears to be built from aluminium throughout, though it's not a single piece like Apple's. The 13.3 inch screen also has a thick

border around it.

Asus has managed to use a traditional keyboard mechanism despite the incredibly thin base, and the response from each key is nice and soft, with minimal keyboard flexing in the centre. The touchpad feels a little bit laggy, but is relatively accurate compared to some of the lesser touchpads found on competing laptops. Unfortunately the keyboard isn't backlit, which is now pretty much standard for most laptops. Typing during an international flight with the lights down low won't be easy as a result.

Where the ZenBook has a huge advantage over the MacBook is in its range of connectivity options. Three USB 3.0 ports are included, and one of these supports Ultra-fast charging of external devices, even when the ZenBook is sleeping. A micro HDMI output makes hooking a second monitor a cinch, while the standard audio jack allows for headphone use. Compared to the single USB 3.0 C connector on the MacBook, there's simply no competition for those who need to plug in a range of external devices, although MacBook buyers can buy an external USB hub to fulfil the same connectivity duties.

There's also the fact that the ZenBook is a Windows 8 device; there's no faffing about with Bootcamp and its assorted

get this laptop working within a Windows ecosystem. Sadly the display isn't touch-compatible, which would have been a nice inclusion to make the most out of Windows 8's touchy feely features, but at this price we can forgive this omission. The display is quite the looker though, using an IPS panel to deliver excellent colour accuracy and contrast, along with a very wide field of view. The 1920 x 1080 resolution is fine for the 13.3 inch display, albeit not in the same league as the Retina display used on the MacBook.

Looking at the hardware within reveals a relatively mid-range selection of components. The Intel Core M-5Y71 has a top Turbo speed of 2.9GHz, but plods along at just 1.2GHz when necessary. As a result, it's passively cooled, removing any and all annoying fan noise. This is paired with 4GB of DDR3 1600 memory, along with a 256GB SSD. However, only 205GB is usable out of the box, due to overprovisioning of the SSD and the mandatory OS and bloatware installs. Thankfully Asus doesn't go overboard with the latter.

This combination of hardware saw the ZenBook come out as the slowest laptop in the standard PCMark 8 Home benchmark, but it performed slightly better in the productivity-focused Office benchmark. Still, it's definitely not the fastest laptop around, something worth considering if you need serious muscle for your daily PC duties. We noticed it struggled with basic duties such as installing or uninstalling software, being noticeably slower than the other, faster laptops. There is a benefit to this relatively meagre hardware, in the form of exceptional battery life. The ZenBook blasted the opposition to reach the top spot in our battery tests, lasting an incredible 421 minutes. Considering our PCMark 8 Home Battery benchmark is incredibly demanding, this is an outstanding result, and in normal duties the ZenBook should easily last all day.

KEY SPECS

\$1399 • www.asus.com.au

13.3 inch 1920 x 1080 display • Intel Core M-5Y71 (2 Cores, HyperThreaded, 1.2GHz base, 2.9GHz Turbo) • Intel HD Graphics 5300 • 4GB DDR3 1600 • 256GB SSD • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: **1994**

Office Accelerated Benchmark: **3278**

OVERALL





Dell XPS 13

ANOTHER ULTRAPORTABLE TO RIVAL THE MACBOOK

On paper the Dell XPS 13 is a very similar critter to the Asus ZenBook. It's a very similar size, adopting the 13.3 inch ultraportable format to go head to head with Apple's new MacBook. Packing what appears to be comparable hardware to the ZenBook, it's only \$100 more expensive. However, after spending quality time with the XPS 13, we have to say that it's definitely the better of the two. For starters, the XPS 13 has more of a premium feel and finish to it, bringing it more in line with the superb build quality of the MacBook. The fact that the display stretches all the way to the edges makes a huge aesthetic difference, foregoing the unattractive border found on the ZenBook. The polished aluminium also feels a little sturdier than the ZenBook UX305, though some may dislike the rubberised finish around the keyboard.

Make no mistake, this is an ultraportable device, tipping the scales at just 1.18kg. It's slightly deeper than the competition, measuring 20mm at its thickest point, which definitely feels chunkier than the ZenBook and MacBook. However, this extra girth has allowed Dell to cram in some of the fastest components around, but more about that in a moment.

The chiclet keyboard design is relatively standard, and each key feels reassuringly sturdy. Dell has wisely adopted a backlit design, possible likely due to the extra depth of the base. The touchpad is superb, being both responsive and accurate, and is definitely superior to the one found on the ZenBook. The screen is superior as well, not just as a result of the borderless "infinity" design employed by Dell. It simply has better colour and contrast performance, yet still offers exceptionally wide viewing angles courtesy of the IPS panel used within. Our version came with the standard HD panel, with a resolution of 1920 x 1080, but Dell also offers a Quad HD panel that packs in 3200 x 1800 pixels. We can only imagine how crisp such a screen would appear, but should point out that Asus offers a similar panel upgrade with the Zenbook.

Unlike the MacBook, the XPS 13 has a healthy range of input/output ports, starting with the twin USB 3.0 ports (Dell also sells a USB dock to increase the number of ports). A mini DisplayPort output handles connectivity for a second monitor, while the usual SD card reader is present on the right side of the base. Finally, an there's an audio jack to handle headphone duties.

So far, so good, but it's the hardware within that propels this laptop to



legendary status. Considering it's one of the smallest laptops in the roundup, we were amazed at this machine's performance. The Intel i5-5200U is unique to the XPS 13, and its twin-cored, HyperThreaded design boosts all the way up to 2.7GHz under load. This is actually slower than the ZenBook's maximum frequency, but the doubling of RAM up to 8GB of DDR3 1600 seems to have helped performance. Or perhaps it's that the 256GB SSD in the XPS 13 is faster than that of the Asus, but regardless the XPS 13 blew the ZenBook away when it comes to performance.

Our PCMark 8 Home benchmark showed that the XPS 13 is the fastest laptop in our roundup, remarkable considering its tiny proportions. This responsive is evident during use, where applications load without hesitation, and swapping between open applications is instantaneous. It also came second in the PCMark 8 Office tests, testimony to the i5 processor used within. Despite this blazing performance, battery life hasn't suffered much at all, posting an impressive result of 369 minutes, just one hour less than the Asus.

When this blazing performance is factored into the equation, there's simply no debate about which is the best ultraportable laptop in our roundup. Combined with its better display, more response trackpad and backlit keyboard, the XPS 13 runs rings around the ZenBook. Considering that it's only \$100 more expensive, and there really is no room to argue; Dell's XPS 13 is easily the best ultraportable Windows 8 laptop in the roundup today.

KEY SPECS

\$1499 • www.dell.com.au

13.3 inch 1920 x 1080 display • Intel i5-5200U (2 Cores, HyperThreaded, 2.2GHz base, 2.7GHz Turbo) • Intel HD Graphics 5500 • 8GB DDR3 1600; 256GB SSD • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: **2870**

Office Accelerated Benchmark: **3829**

OVERALL





Lenovo ThinkPad T550

THE HIGH PRICE TAG IS HARD TO JUSTIFY

Portability be damned; sometimes you want a laptop that includes a big, beautiful display, along with a full keyboard. Not everybody needs a laptop designed for hauling around all day, and the Lenovo ThinkPad T550 is one such laptop that will happily reside on your desk for the better part of its life. However, it faces stiff competition from both MSI and Toshiba in the 15.6 inch format, so let's see if the T550 has what it takes to come out on top.

As mentioned, this isn't an ultraportable laptop built with slim lines or a low weight in mind; it's a full-sized bruiser. Weighing 2.13kg, it's actually the lightest of the 15.6 inch laptops that we reviewed, but only by a relatively small margin. Despite its relatively large dimensions, it remains rather shallow, with a maximum depth of just 22mm. The entire external chassis is built from rough black plastic, which doesn't exactly lend

it a premium feel, yet it doesn't feel like it's about to fall apart if it takes a tumble from your desk.

A result of the large display is the ability to include a nice, large keyboard. Lenovo has gone with the chiclet design favoured by most laptop makers, and it feels nice and sturdy despite the plastic chassis, with no flex in the centre of the keyboard. This just happens to be the same spot where Lenovo has included a pointing nub, a quaint inclusion targeted at the few users who prefer a nub to the touchpad. If you'd prefer to use the touchpad instead, the one featured here is reasonably accurate, though it does feel like the mouse cursor stutters a little when the touchpad is used. A unique inclusion on the T550 is the fingerprint reader to the right of the touchpad, a nod to this machine's corporate leanings.

The large 15.6 inch display is surrounded by a thick border of around a centimetre of plastic; compared to the edgeless designs used elsewhere it presents as rather old fashioned. It's a 1920 x 1080 display, which is about as low as we'd like to see a screen of this size go. The display in our model is apparently an LED screen, yet it displays surprisingly decent field of view performance, with minimal colour and brightness shifting at obtuse viewing angles. It's a little washed out compared to the better displays seen here though.

With such a large chassis, Lenovo has plenty of room to stock the T550 with goodies, and it has opted for an interesting CPU in the Intel i5-5200U. This twin-cored, HyperThreaded beast has a base speed of 2.2GHz base, yet reaches just 2.7GHz when Intel's Turbo mode kicks in, making it one of the lesser CPUs in our roundup... on paper at least. It's paired with a rather meagre 4GB of DDR3 1600 memory, which is more than enough to run the elderly Windows 7 Pro Operating System that comes by default with this machine, again showing that it's intended for corporate environs that are likely running the older version of Windows. Forget any form of SSD, as the T550 uses a 500GB mechanical drive. Thankfully it's a Hybrid drive with an 8GB cache, helping to slightly boost it out of the doldrums of standard mechanical drive performance. In fact, it performed admirably despite the lack of an SSD and deficit in memory, as evidenced by our benchmarks.

In the PCMark 8 Home benchmark, the hardware combination delivered the second fastest performance in the roundup, showing that the i5 CPU is a capable processor compared to the leaner offerings used elsewhere. It was third fastest in the Office benchmark, and also delivered excellent battery performance in our final benchmark, with a result of 395 minutes. This makes it the second best performer in terms of battery life, proving it's capable of going a full day without needing to find a power point.

With these excellent performance results, we can forgive the T550's rather average overall presentation. It might not look like a premium machine thanks to its fondness for plastic in the construction, but it turned in blazing benchmark results, showing that this is a capable performer for those looking for a large, desktop replacement laptop. Still, for just \$200 more, we think MSI's PE60 makes for a substantially better buy.

KEY SPECS

\$1749 • www.lenovo.com.au

15.6 inch 1920 x 1080 display • Intel i5-5200U (2 Cores, HyperThreaded, 2.2GHz base, 2.7GHz Turbo) • Intel HD Graphics 5500 • 4GB DDR3 1600 • 500GB Hybrid HDD • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: **2534**

Office Accelerated Benchmark: **3784**

OVERALL





MSI PE60-111AU

A PERFORMANCE POWERHOUSE

As the most expensive laptop in our roundup, MSI's new PE60 has a lot to prove. Can this 15.6 inch heavyweight deliver enough goodies to make the high price tag justified, especially when it's facing such stiff competition from the likes of Lenovo?

In a word, yes, and it all comes down to the hardware MSI has stuffed inside. When it comes to hardware specifications, the PE60 is hard to beat, including many more features than every other laptop in the roundup. Let's begin with the CPU, an Intel Core i5-4210H.

This is a twin-core, HyperThreaded chip that has a base speed of 2.9GHz, which boosts all the way up to 3.5GHz in Turbo mode. This makes it easily the most powerful processor of all those included in our roundup. As if that wasn't enough, MSI has also thrown in a dedicated GPU in the form of the Nvidia GTX 950M. It's not fast enough to teach Battlefield 4

a lesson, but is more than capable at running less demanding games such as League of Legends or World of Warcraft, and it's the only laptop in our roundup to feature dedicated graphics. Compared to the integrated Intel graphics on offer

elsewhere, the 950M simply wipes the floor with the competition.

A healthy 8GB of DDR3 1600 memory is included, along with not one but two hard drives. The first is a 128GB SSD, perfect for the OS and your favourite applications, and it's backed up by a whopping 1TB 7200RPM mechanical drive. Like we said, this baby has far better specs than the rest. Which makes its benchmark results somewhat puzzling...

Our review sample came second slowest in the PCMark 8 Home benchmark, yet blitzed the rest of the pack in the Office benchmark. There are two possible reasons for the Home benchmark being so slow. Firstly, our review unit was an engineering sample, so there could be driver issues. In which case, it should perform admirably once the final retail version rolls out. However, it could also be caused by the glut of bloatware that MSI installs on its laptops; we all know how this can impact performance, so we beg of MSI to cut back on the number of preinstalled apps that it includes with its laptops. Looking at the taskbar notification icons, we spotted 14 out of the box, many of which are bloatware related.

The engineering nature of our sample also introduced another problem during testing. Our battery benchmark requires



each laptop screen to be calibrated to a baseline brightness, and we selected 50 LUX for this roundup. However, the MSI laptop's brightness adjustment feature was not working on our review sample, so we had to test it at 100% brightness. It was no surprise to see the battery run dry after just 89 minutes, so we've left out its battery test score as a result. Having said that, the powerful hardware within will likely compromise battery life somewhat, so don't expect this machine to compete with the likes of the ZenBook when it comes to power use.

As far as the exterior of the package, the PE60 is a little bit of a mixed bag. It looks great thanks to the polished aluminium, but also uses plastic on the base and around the display. The keyboard is one of the best in the roundup, with perfect spacing and key travel, not to mention bright, adjustable backlighting, but the touchpad wasn't quite as reliable. Sometimes it felt perfect; at others it seemed to malfunction, being overly sensitive to finger lifting. Again, likely as a result of this being an engineering sample. Unlike most other laptops, this one includes a DVD burner, and a healthy range of I/O options. Rounding out the exterior is the vibrant 1920 x 1080 15.6 inch display, which proved to be one of the most colour accurate of those in the test.

MSI has delivered a cracker of a laptop in the PE60-111AU; we only wish we could have seen the final retail version, which is likely to have smoothed out a few of the rough edges found on the engineering sample. We're confident MSI has though, based on our experience with its past laptops, and there's simply no denying how powerful and well-featured this laptop is.

KEY SPECS

\$1999 • <http://au.msi.com>

15.6 inch 1920 x 1080 display • Intel i5-5200U (2 Cores, HyperThreaded, 2.2GHz base, 2.7GHz Turbo) • NVIDIA GTX 950M • 4GB DDR3 1600 • 128GB SSD + 1TB HDD • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: 2119
Office Accelerated Benchmark: 4320

OVERALL





Toshiba Satellite P50W

AN AFFORDABLE CONVERTIBLE

Toshiba's Satellite P50W is aimed at those who want a full-sized, 15.6 inch laptop, but who don't want to pay a full-sized price for the privilege. At just \$1599 it's substantially cheaper than many competing laptops in this size range, but Toshiba has had to make several compromises to get the price down so low, mostly regarding the internal components. On the flipside, it's also included one major goodie missing from other laptops at this price range – a reversible touch screen.

Thanks to the twin rotating hinges, it's possible to convert the P50W into tent or tablet mode. In the latter, it's one of the biggest tablets we've seen, thanks to the large 15.6 inch display, and thankfully all of the keys are disabled when in this mode. Unfortunately the shiny screen covering makes viewing the screen in tablet mode a little uncomfortable, as it acts like a giant mirror. The backlighting also seems to work much better when the screen is viewed horizontally, not vertically, as there appears to be a dark band running down part of the screen



when viewed vertically, that moves depending on the angle you view the screen from. However, it's a small price to pay considering you're getting a convertible at this price. The touchscreen is nice and accurate, enabling us to easily resize windows just by dragging on their edges, and it's a very good match for the Windows 8 OS that comes as standard on this laptop. This one feature will be enough to make the P50W a must-buy for some, and the inclusion of a Blu-ray burner makes it a killer movie viewer when placed in Tent mode.

When not in tablet or tent mode, the P50W operates just like every other 15.6 inch laptop on the market. Brushed aluminium covers the top rear and keyboard exterior, with rubberised plastic used on the other two surfaces. It looks like a premium product, even considering the large black border around the display; this is because the glass used to cover the display goes all the way to the edges of the top half, over the black display border.

The backlit keyboard is excellent, and makes full use of the roomier dimensions offered by the 15.6 inch form factor. Interestingly, the keyboard is dropped slightly compared to where the user rests their wrists, which is a more ergonomic design than flat keyboards, as it mimics the action found when a raised wrist-rest is used. The touchpad is also nice and accurate, though the default acceleration



options take a little getting used to. Thankfully it's just as easy to touch on the screen as it is to use the touchpad, though the screen does wobble a little when doing so, as the twin hinges aren't quite stiff enough to prevent this. It's a common issue with convertibles though, so we shouldn't single out Toshiba's efforts.

Despite the glossy finish, we loved the IPS 1920 x 1080 panel that makes up the 15.6 display. Colours are rich and vivid, while contrast is punchy and distinguished. Overall it presents a very pretty picture, even to wide viewing angles thanks to the use of IPS technology.

Given the excellent touchscreen and convertible nature of this laptop, you're probably wondering how Toshiba managed to make it so affordable. The answer is simple – the internal specs of the machine aren't quite up there with the likes of its competitors. The heavy lifting is handled by an Intel Core i5-4210U CPU, a twin-cored, HyperThreaded critter with a base speed of 1.7GHz, and Turbo speed of 2.7GHz. It's certainly no slouch, and Toshiba has wisely paired it with the full 8GB of DDR3 1600 that Windows 8 demands to operate well. Unfortunately the hardware falls down when it comes to storage, as the 1TB mechanical drive isn't in the same league as SSDs. Thankfully it's a hybrid drive though, which does indeed provide a substantial performance boost. Not enough to propel it from the middle of the pack in our Home benchmark, or last in the Office benchmark though. Battery life is also severely lacking compared to the rest.

Despite the performance quibbles, the P50W offers functionality that the others lack, at a price point that is outstanding. If you're looking for a capable mainstream laptop that makes for a killer demo machine in tent mode, then look no further than the P50W.

KEY SPECS

\$1599 • www.mytoshiba.com.au

15.6 inch 1920 x 1080 display • Intel Core i5-4210U (2 Cores, HyperThreaded, 1.7GHz base, 2.7GHz Turbo) • Intel HD Graphics 4400 • 8GB DDR3 1600 • 500GB Hybrid HDD • 802.11ac/a/b/g/n

PCMARK 8

Home Accelerated Benchmark: **2164**

Office Accelerated Benchmark: **2965**

OVERALL



CLOUD STORAGE

FROM CONFUSION TO UBIQUITY, CLOUD STORAGE IS NOW FIRMLY CEMENTED IN OUR DAILY DIGITAL LIVES. WE TEST THE FIELD.

The term “cloud storage” is becoming less and less appropriate: today, the popular services all offer much more than just storage. Of course, they still provide capacity in the cloud where you can keep your most important files, photos, documents and data, and give you the tools to access them from anywhere.

More than this, though, cloud-storage services have become the glue that holds our post-PC world together. While there are doubtless people who still rely on one desktop or laptop computer, more and more of us now spread our work across multiple devices, including PCs, tablets and smartphones. To do this effectively we need a centralised way of accessing, viewing, editing and saving our files. Cloud-storage services not only let us read and write files from any device and location; transparent synchronisation ensures we’re always working on the most up-to-date file every time.

Even more than this, cloud services enable us to share, so that others can view our files, or collaborate with us on them in a secure and managed way. That’s great news even if you’re just using cloud storage to hold and share your photos; for freelancers and small businesses, it opens up whole new workflows. And since cloud-storage servers are remote from your physical location, they can also be a life-saver when disaster strikes. Come fire, theft or flood, the files that matter most to you are safely stored far away.



CONTENTS

Box	67	Mozy	74
Microsoft OneDrive	68	SugarSync	74
Amazon Cloud Drive	70		
Apple iCloud	70	Feature table	62
Bitcasa Drive	71	Privacy and security	
Dropbox	71	– the big cloud questions	64
Google Drive	72	View from the Labs	75
Livedrive	72	Key data	75



WHAT TO LOOK FOR

Cloud-storage services are built on three pillars. The first is storage: secure, always-available space on a remote server. If you're simply looking to store and share documents and the odd photo, you can get several gigabytes of space for free, and this may even suit small businesses. Many of us, however, need a place to store larger audio or video libraries for easy access, or to hold extensive business file repositories. In that case, a paid service will provide the capacity you require, and it doesn't have to be expensive: you can get dozens of gigabytes for a few dollars per month.

Make sure to read the small print, however. Common gotchas include

file-size limits, such as requiring the files you upload to be under 250MB. Or, there may be a maximum number of files you can upload, although this is usually in the tens of thousands.

The second pillar is connectivity. You need robust, speedy connectivity so you can access your stuff whenever you want, and so that uploading and downloading files doesn't become too onerous. Slow uploads can be a particular problem if you're in an area where fibre is still a distant dream; uploading several gigabytes of data might take hours or even days. The good news is that cloud services are designed to trickle uploads in the background, so you can just leave them syncing

while you get on with other tasks. Many desktop clients have a user-adjustable bandwidth throttle to ensure that they don't cripple your connection.

The final pillar is synchronisation – the ability to ensure that the latest versions of your files and folders are available across all your systems. We take this for granted today, but it hasn't always been ubiquitous: Microsoft's first sync service, Live Mesh, was a separate product to its storage service.

Nowadays, almost every major service has it working, either automatically syncing the contents of a single folder, or allowing you to choose which folders and subfolders on one PC will sync across to others.

	Amazon Cloud Drive	Apple iCloud	Bitcasa Drive	BEST FOR BUSINESS	
	Amazon Cloud Drive	Apple iCloud	Bitcasa Drive	Box	Dropbox
OVERALL	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Website	amazon.com.au/cloudrive	apple.com.au/icloud	bitcasa.com/personal	box.com	dropbox.com
Free capacity	5GB	5GB	5GB	10GB	2GB
Price 20GB	\$10/yr	\$1.29/mth	N/A	N/A	N/A
Price 50GB	\$25/yr	N/A	N/A	N/A	N/A
Price 100GB	\$50/yr	N/A	N/A	US\$6/mth	N/A
Price 200GB	\$100/yr	\$4.99/mth	N/A	N/A	N/A
Price 500GB	\$250/yr	\$12.99/mth	N/A	N/A	N/A
Price 1TB	\$500/yr	\$24.99/mth	US\$10/mth, US\$99/yr	N/A	\$10.99/mth
Other	N/A	N/A	10TB, US\$99/mth, US\$999/yr	Unlimited, US\$17/mth per user	\$17/mth unlimited business
CLIENTS & APPS					
Windows desktop/Modern app	✓/✗	✓/✗	✓/✗	✓/✓	✓/✓
OS X client / iOS app	✓ / Photo only	Integrated	✓ / ✓	✓ / ✓	✓ / ✓
Windows Phone 8 app	✗	✗	✗	✓	✓
Android app	Photo only	✗	✓	✓	✓
Fire OS app	✓	✗	✗	✓	✓
BlackBerry app	✗	✗	✗	✓	✓
DESKTOP CLIENT FEATS					
File sync / file & folder sharing	✗ / ✓	✓ / ✓	✓ / ✗	✓ / ✓	✓ / ✓
Selective sync	✗	✗	✓	✓	✓
Online backup	✗	✗	✓	✗	✗
Bandwidth throttle	✗	✗	✓	✗	✓
Encryption at rest	✗	128-bit AES	256-bit AES / 2,048-bit RSA	256-bit AES	256-bit AES
Two-step authentication	✗	✗	✗	✗	Optional
LAN sync	✗	✗	✗	✗	✓
APP FEATURES					
File & folder sharing	✗	✗	✓	✓	✓
Photo browsing	✓	✓	✓	✓	✓
Music streaming	✗	✗	✓	✓	✓
Document preview / editing	✗ / ✗	✗	✓ / ✗	✓ / ✓	✓ / ✓
Automatic camera upload	✓	✓	✓	✗	✓
BROWSER FEATURES					
File & folder sharing	File only	✗	✓	✓	✓
Photo browsing	✓	✗	✓	✓	✓
Music streaming	✗	✓	✓	✓	✓
Document preview / editing	✗ / ✗	✗ / ✗	✓ / ✗	✓ / ✗	✓ / ✗

ACCESSIBILITY

Most cloud services offer a desktop client, but all are also accessible via the web. What you can do in the browser varies widely, however. You should, at the very least, be able to upload and download individual files; most services let you upload and download entire folders, preview documents, and browse and view photos in a gallery. The major services also offer basic document editing, plus the ability to preview videos and music. Sharing features are common too, so other users can access and even edit files online.

As cloud storage has become such a vital piece of linking infrastructure, mobile access is also very important.

The big services now tend to support Windows 7 and 8.1, OS X, iOS and Android, with some also supporting BlackBerry and Windows Phone.

Again, the capabilities of apps vary, with some offering little more than an interface to upload and download. If you're paying for a service, check how well it's supported on your phone or tablet operating system, and how feature-rich the apps in question are.

Automated camera upload, for instance, may seem unnecessary for many of us, but when you come home from a long weekend with a smartphone full of your latest photos, it's good to know they'll all be safe and accessible online within minutes.

HOW WE TEST

This month we've looked at ten of the biggest names in cloud storage, focusing on ease of use, desktop features, in-browser capabilities and mobile apps, as well as price and capacity. We uploaded 500MB of test files to each service on one laptop, installed the desktop client on another, then synced accounts to see how long the test files took to download. We then modified three photo files to see how long it took for a modified file to sync across from one system to another. We turned up any bandwidth throttle to the maximum speed and turned off Sync-over-LAN, to ensure that files were synced over the internet, not only on the local network.

RECOMMENDED		LABS WINNER		
Google Drive	Livedrive	Microsoft OneDrive	Mozy	SugarSync
★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆
google.com.au/drive	livedrive.com	onedrive.live.com	mozy.com	sugarsync.com
15GB	N/A	15GB	N/A	5GB (trial only)
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	1PC, £5/mth	N/A
\$US1.99/mth	N/A	\$2/mth	N/A	US\$7/mth, US\$75/yr
N/A	N/A	\$4/mth	N/A	N/A
N/A	N/A	N/A	N/A	US\$25/mth, US\$250/yr
US\$9.99/mth	N/A	\$9/mth	N/A	US\$55/mth, US\$550/yr
N/A	2TB, £10/mth; 5TB, £15/mth	N/A	125GB, 3 PCs, US\$5.99/mth	250GB, US\$10/mth or US\$100/yr
✓/✗	✓/✓	✓/✓	✓/✗	✓/✓
✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
✗	✗	✓	✗	✗
✓	✓	✓	✓	✓
✗	✗	✓	✓	✓
✗	✗	✓	✗	✓
✓/✓	✓/✓	✓/✓	✓/✗	✓/✓
✓	✓	✓	✗	✓
✗	Optional	✗	✓	✓
✓	✓	✗	✓	✓
128-bit AES	256-bit AES	✗	448-bit Blowfish	256-bit AES
Optional	✗	✓	✗	✗
✗	✓	✗	✗	✗
✓	✗	✓	✗	✓
✓	✓	✓	✓	✓
✓	iOS only	✗	✗	✓
✓/✓	✓/✓	✓/✓	iOS only / ✗	✓/✓
✓	✗	✓	✗	iOS only
✓	✓	✓	✗	✓
✓	✓	✓	✗	✓
✓	✓	✗	✗	✗
✓/✓ (Google Docs/Sheets/Slides)	✗/✓ (via Zoho)	✓/✓ (Office Online)	✗/✗	✗/✗





Privacy and security – the big cloud questions

CAN YOU TRUST A REMOTE CLOUD COMPANY TO KEEP YOUR DATA SAFE FROM CRIMINALS AND SNOOPING GOVERNMENTS?

For many people, the biggest concerns over cloud-based services have little to do with features, connectivity or capacity, and everything to do with security and privacy. While the truth is somewhat more complex, it seems intuitive that data stored on a local PC or NAS drive should be secure, while data stored remotely in some nebulous cloud is vulnerable to attack from hackers, fraudsters and numerous sinister agencies.

As a result, we look for reassurance from cloud services that our data will be secure and our privacy respected. Following the Snowden revelations and last year's celebrity security breaches, that need has only grown.

Businesses have particular concerns. Not only do they have their own business-sensitive data to safeguard, but they have a duty of care over any customer or employee data they might have on their systems. For all businesses handling personal data, the Commonwealth Privacy Act 1988 requires that this data is processed in accordance with the rights of data subjects – the customers, employees or other parties whose data is being

handled – and that appropriate measures are taken to protect it against unauthorised or unlawful processing. Get it wrong, and your company could be on the line.

To make things more complex, the Act also requires that personal data shall not be transferred to a country or

“If you’re concerned about US authorities browsing through your files, it’s probably best not to use US-based services”

territory outside Australia, unless that country or territory ensures adequate protection for the same rights and freedoms; a challenge in an industry that has historically been dominated by US corporations.

Should you be concerned about security, privacy and personal data, or do the cloud firms have you covered?

SECURITY

On the one hand, there's no doubt that big cloud services are a juicy target for hackers, as demonstrated by last year's attempts to use stolen credentials to log

in to Dropbox, and the iCloud celebrity photo leaks.

On the other hand, cloud services have stronger security practices and more resources at their disposal than most small-to-medium enterprises – not to mention individuals.

That doesn't mean they're perfect. All major cloud services now protect data in transit using SSL, but how data is secured while at rest will differ. Dropbox, SugarSync, Box and Livedrive use 256-bit AES encryption, while Google Drive and Apple iCloud use weaker 128-bit AES. Amazon and Microsoft offer no encryption at all on their consumer services, although Microsoft does offer per-file encryption on its OneDrive for Business products.

The biggest weaknesses, however, lie where the service meets the end user. This doesn't necessarily mean weak or easily guessed passwords, although these can be an issue. Last year's Dropbox file breach didn't involve hackers attacking the service directly, but stealing usernames and passwords from other services with poorer security, then trying them out on Dropbox.

The iCloud breaches, meanwhile, occurred because hackers could use publicly available information to trigger password resets. More cloud services, including Dropbox, OneDrive, Google Drive and iCloud, are now using optional or even mandatory two-factor authentication, where new systems aren't allowed to join an account without authorisation from the user from another app or device – usually a code texted to a registered mobile phone.

If your cloud-service provider offers two-factor authentication, use it. It will barely affect you in everyday use, but it could stop hackers in the future.

PRIVACY

Beyond hackers attempting to steal your files, there are two major potential threats to your privacy. The first is that employees of the service, or automated processes used by the service, may be able to access and take information from your files.

In most cases, this comes down to services having permission to use, modify, adapt, reproduce and display the content you upload to the service to the extent necessary to provide a functional service, or permission to analyse the content you're uploading to provide you with search results or targeted advertising.

You'll find details of what permissions or rights a service takes in the terms of



NST-D306S3-RD

NexStar[®]
USB 3.0 Hard Drive Dock
SATA 6GB/s



NST-D306S3-GR

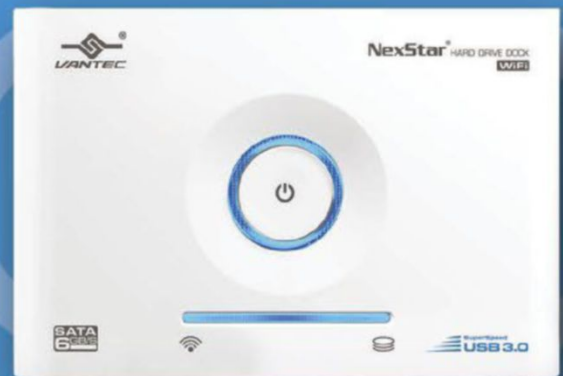
Compatible with 2.5"/3.5" SATA I/II/III HD
Install & Access in Seconds
Supports Current SATA 6G Hard Drives
Simple to Use Design; No Screws Required

NexStar[®] HARD DRIVE DOCK

WiFi



Supports Internet Tethering So You Can Access the Internet While Connected
Media Server functions to support UPnP Enabled Consoles
Download App Available on the App Store and Google Play

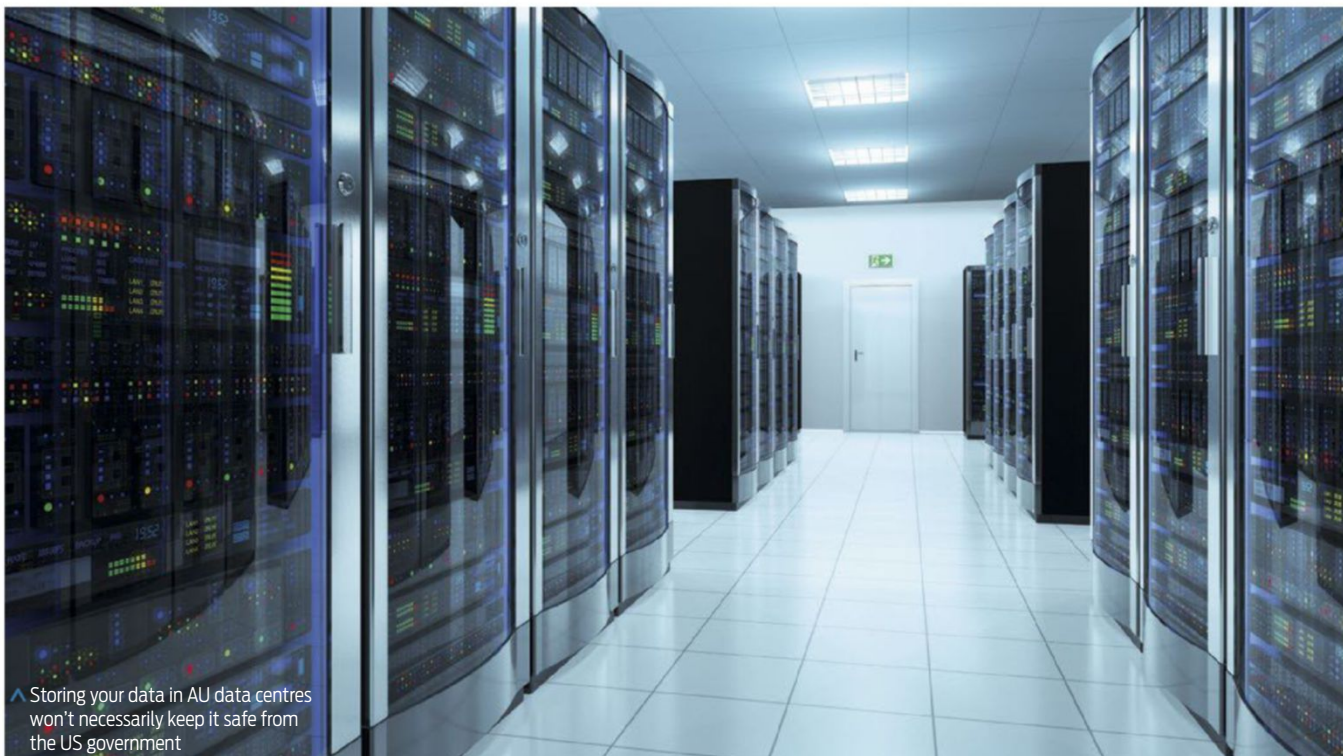


NST-D306W53



You can find these at the following retailers:

ADE	Allneeds Computers	08 8211 8661	allneeds.com.au
BRI	Umart Online Computer Alliance	07 3361 8188 07 3421 3200	umart.com.au computeralliance.com.au
MEL	PC Case Gear Centre Com	03 9560 2122 03 8311 7600	pccasegear.com centrecom.com.au
PER	Austin Computers PLE Computers	1300 787 429 08 6316 3882	austin.net.au ple.com.au
SYD	Mwave Online Computer	1300 727 446 (02) 9211 0898	mwave.com.au onlinecomputer.com.au



▲ Storing your data in AU data centres won't necessarily keep it safe from the US government

"If you're concerned about US authorities browsing through your files, it's probably best not to use US-based services"



▲ Leaks from Edward Snowden revealed the extent of NSA snooping



▲ Like Enigma, most cloud-stored data is encrypted in transit, but not all services encrypt in situ

service, but in general services are careful to state that users retain ownership of the content held in the cloud, and that users must be able to control who can access that content.

Employees may be able to access information for legal, technical or safety reasons, but the privacy policy and terms of service should clarify the conditions when this might happen and the level of access allowed.

The more thorny issue is government snooping. Edward Snowden's revelations made it clear that the NSA was both willing and able to access data held by the world's largest internet companies. This clearly affects data stored on US servers, but the more surprising thing is that data held within Australia isn't necessarily safe from the snoopers either.

In theory, if US law enforcement

requires information from companies operating in Australia, then it must use the existing legal channels of co-operation and mutual assistance. However, the USA Patriot Act trumps this, requiring US-owned companies and foreign subsidiaries to comply with US government requests, regardless of where the data is held. Nor does the company have to inform users of access, although this contravenes Australian legislation.

In February 2013, former Microsoft privacy chief Caspar Bowden confirmed that US law allows the government to spy on non-US citizens' files and documents.

In September last year, a New York court ordered Microsoft to hand to US

prosecutors the emails of a European customer stored on its servers in Ireland as part of a drugs-trafficking investigation. Microsoft refused and appealed; the case is still ongoing at the time of writing.

Things may change in the US with the reintroduction of the Law Enforcement Access to Data Stored Abroad (LEADS) Act or possible reforms to the Electronic Communications Privacy Act (ECPA), both of which aim to clarify and limit the powers of government snoopers. For now, though, if you're concerned about US authorities browsing through your files, it's probably best not to use US-based services, even if those same companies happen to also run servers in Australia.

Box

A BRILLIANT BUSINESS-FOCUSED CLOUD SERVICE THAT'S BRIMMING WITH FEATURES, BUT IT'S EXPENSIVE

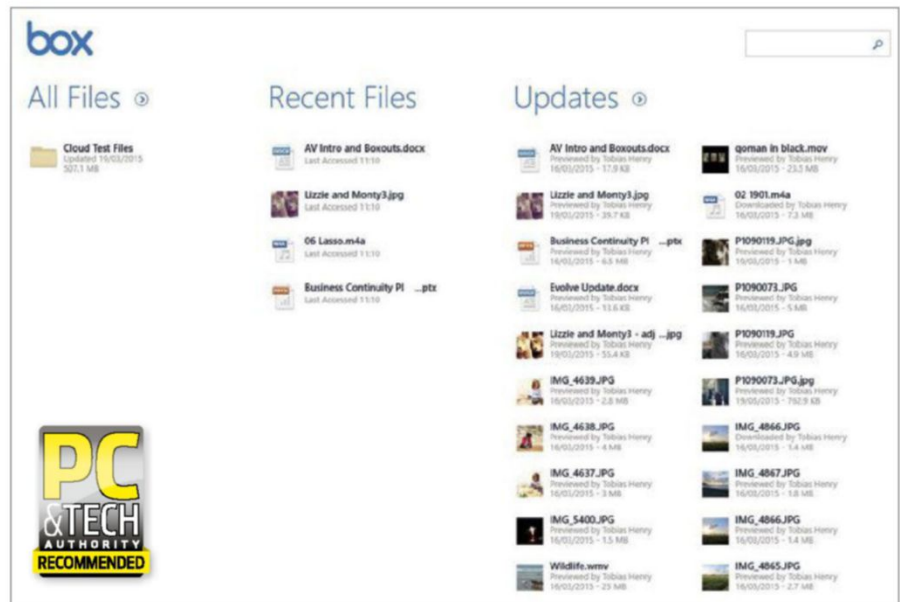
For a long time, Box's Achilles heel was its lack of synchronisation. It was a great place to store and share files across a business, but ensuring that you had the most up-to-date data across all of your PCs took work. Box's Sync client has fixed this, however, while new features such as the integrated text/notes editor Box Notes make it an even stronger choice for business use.

Synchronisation is now well handled, with a simple, Dropbox-style drag-and-drop approach. There are also selective sync options, where you can turn sync on and off for individual folders – good for devices with limited capacity – and informative notifications from the system-tray applet. Box has also tightened up the practicalities, with improved support for long filenames, seamless synchronisation of open documents, and a right-click Share feature, all of which bring it closer to parity with Dropbox.

Box has traditionally pulled ahead of the likes of Dropbox, Google Drive and OneDrive as a fully featured collaboration platform, and while Dropbox's business packages have eroded the lead, Box still feels like the better option here. Larger organisations get the features and management tools they need to administer and secure shared documents and resources, while smaller businesses will appreciate the way Box integrates tasks and commenting into the workflow.

What's more, Box supports a comprehensive range of apps and add-ons, many of them free. If you want to open and save Microsoft Office files directly in and out of Box, there's an app to help you do that, and there are similar apps to get Box working with Salesforce, NetSuite and a range of other cloud-based services and productivity applications.

Cross-platform support is another strength, with desktop clients for OS X and Windows, a touch-friendly Modern Windows app and native mobile apps for iPad and iPhone, Android devices, Windows Phone 8 and BlackBerry 10 OS. The iPad app is particularly good, with strong document-preview and media-handling features, and built-in



Box's cross-platform support is exemplary; there's even a Modern app for Windows



commenting. The Android and Windows Phone 8 versions aren't far behind, either, even if media playback is patchier.

It's not all good news. Box's download speeds were mediocre: it took almost nine minutes to download files that other services could complete in six or fewer. More important are syncing speeds for everyday use, though, and these were more impressive.

It's also worth pointing out that while Box's free option comes with a Dropbox-beating 10GB of storage, there's a 250MB

maximum file size; not a problem if you're uploading photos, audio files and documents, but a concern if you're working with video or multilayered, high-resolution graphics files.

The biggest point against Box used to be price; US\$6 per month for 100GB of storage (with a 5GB maximum file size) is still on the steep side compared with Dropbox, Google Drive or OneDrive, while the £11 per user per month rate for Box Business may cause smaller companies to look elsewhere. Happily, Box also offers a Starter package where three to ten users get 100GB with a maximum 2GB file size at US\$6 per user per month. Given Box's powerful, business-focused feature set, that's a bargain, while we'd still opt for OneDrive or Dropbox for personal use, it's enough to put Box ahead for work.

KEY SPECS

www.box.com

10GB, free; 100GB, US\$6/mth; 100GB Box Starter, US\$6/mth per user; unlimited, \$US/mth per user

OVERALL



Microsoft OneDrive

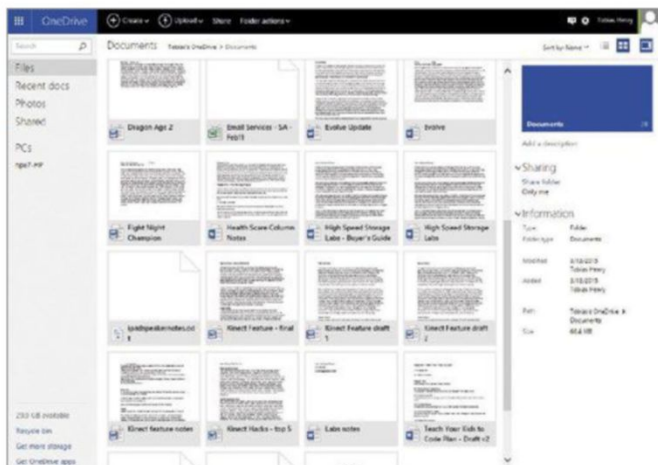
A POWERFUL AND VERSATILE ALL-ROUND SERVICE THAT OFFERS UNBEATABLE VALUE FOR MONEY FOR PERSONAL USE

For obvious reasons, OneDrive has a clear advantage over other services on Windows PCs. Not only is it baked into Windows 8.1, where signing in with your Microsoft account also signs you in to OneDrive, but it's also treated as the default file location for Office 2013. Opt for a Windows Phone 8 smartphone and/or a Windows 8.1 tablet, and using OneDrive becomes so easy and seamless that it's practically a no-brainer. The only surprise might be that, beyond this, there are also plenty of other good reasons to use Microsoft's cloud-storage solution.

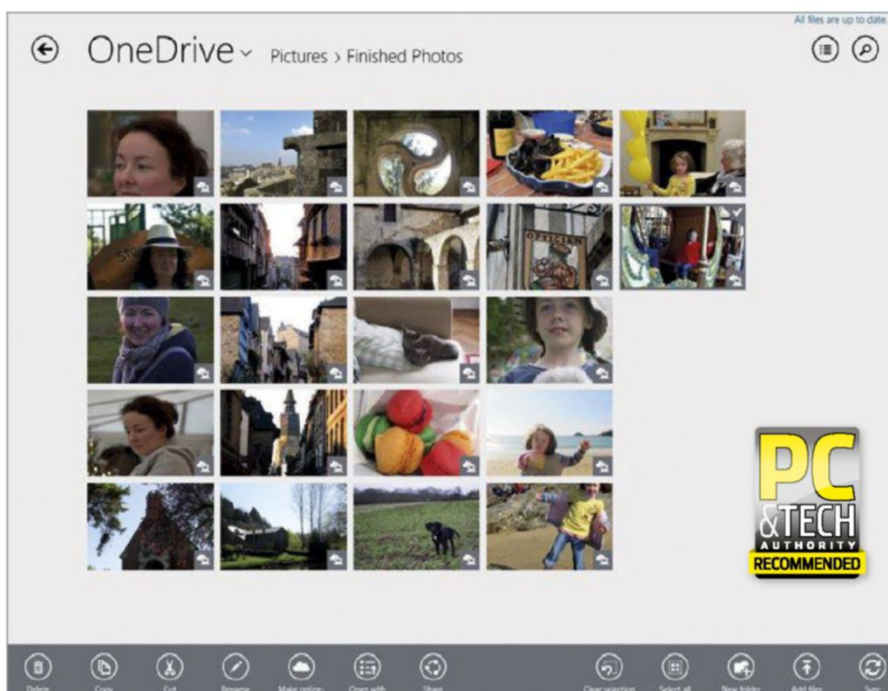
For a start, it works intelligently. Rather

than copy every file into every synced folder on every machine, OneDrive syncs only those that you have used recently or regularly, then downloads others on demand. This can be a pain if you're offline at the time, but mostly it works well, and means you can sync the OneDrive on your 2TB desktop hard drive with the OneDrive on your 64GB tablet.

Microsoft's sync applet is easy to use and keeps you up to date with notifications. Our biggest complaint is that you can't share files or folders with a simple right-click, but need to do so online in your browser.



OneDrive sync is baked into Windows 8.1



Luckily, that's easy to do, and there are many other powerful features to be found here as well. With the online Office apps integrated into OneDrive, you can quickly preview Office documents and a range of other common file types, then go in and edit them using apps that share the desktop Office look and feel. OneDrive has the best photo-browsing features of any service, with a great built-in slideshow, and you can stream music directly from OneDrive in the browser, or by using the Xbox Music apps on Windows Phone, Xbox consoles and PCs.

In addition, OneDrive benefits from Microsoft's recently adapted openness to non-Windows platforms. The apps for Android and iOS don't stint on features, including automatic uploads from your smartphone's camera roll. Both versions will allow you to preview and edit files using the new mobile Office apps if you have them installed, and you can share files and folders with ease. And while Dropbox still feels a better fit for those working across Windows and OS X – particularly if you share a lot of folders – OneDrive is catching up. Sync works as well on OS X as it does on Microsoft's own Windows OS.

Microsoft has improved OneDrive's sync performance, too, allowing more simultaneous connections when uploading and downloading files. As a result, it's now pretty speedy, both when downloading a lot of files and when syncing individual files.

Yet the best reason to opt for OneDrive is undoubtedly price. You can have 15GB of storage absolutely free, or get 100GB for only \$2 per month. Pay \$9 per month and you not only get 1TB of storage but also Office 365 Personal, with 60 Skype minutes and the Office desktop apps on one PC or Mac plus one tablet – a deal that other cloud services just can't match.

OneDrive is just as competitive in the business sphere, where you can either use it solo or as part of the Office 365 Business Essentials bundle for \$4 per user per month. Either way, it's hard to beat.

KEY SPECS

www.onedrive.live.com

15GB, free; 100GB, \$2/mth; 200GB, \$4/mth; 1TB, 96/mth

OVERALL



Vigor2860ac

Perfect NBN Solution for Small-to-Medium Businesses

DrayTek
Aust & NZ
www.draytek.com.au

VDSL2 /ADSL2+ Multi-WAN Gigabit router with dual USB ports for 3G/4G connectivity and IEEE 802.11ac Wi-Fi achieving speeds up to 1300Mbps



new



Now Available!



Features:

- ✓ Multi-WAN with VDSL2/ADSL2+, Gigabit Ethernet WAN (NBN), USB ports for 3G/4G dongles
- ✓ Flexible Failover and Load-Balancing among Multi-WANs.
- ✓ Two USB ports for connection to Two 3G/4G LTE USB modems, FTP server and network printer
- ✓ Supports VigorACS SI (Central Management system) for multi-site deployment
- ✓ Object-based SPI Firewall and CSM (Content Security Management) for network security
- ✓ Multiple VLANs provide secure and efficient workgroup management
- ✓ Six Gigabit LAN ports with multiple subnets
- ✓ Thirty-two VPN tunnels with comprehensive secure protocols
- ✓ Advanced VPN load-balancing and site-to-site backup functions
- ✓ Integrated IEEE 802.11ac wireless Access Point; dual band; up to 1300Mbps throughput
- ✓ Embedded Central VPN Management for 8 remote Vigor routers
- ✓ Embedded Central AP Management for Vigor Wireless access Points
- ✓ Free Smart Monitor Network Traffic Analyzer for 30-nodes



i-LAN Technology Pty Ltd trading as DrayTek Aust & NZ
www.i-lan.com.au (02) 9838 8899 sales@i-lan.com.au

© Copyright 2015 i-LAN Technology Pty Ltd. All rights reserved.

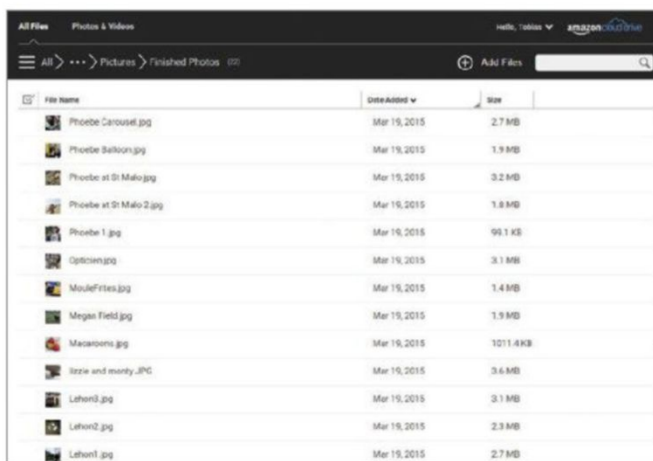
Amazon Cloud Drive

A DISAPPOINTINGLY BASIC SERVICE, LACKING IN FEATURES AND NOT EVEN GOOD VALUE FOR MONEY

Given Amazon's background with its high-end AWS cloud services, you'd expect something special from its consumer-level cloud-storage service. Sadly, you'd be disappointed. Amazon's customers can't grumble about getting 5GB of free space, while Fire Phone owners and Amazon Prime subscribers get unlimited photo storage, but this is still a surprisingly basic effort.

For a start, Cloud Drive no longer offers sync capabilities. The Sync desktop client that was available last year has been pulled in favour of a client that offers little more than basic uploads and downloads. The Android and iOS apps support photo uploads, but nothing else. If you're looking for document-sharing or media-streaming features, you'll have to look elsewhere.

The desktop client is lean and functional, with a simple drag-and-drop interface for uploading files and folders.



◀ The tools for navigating and sharing photos are a strong point

However, beyond that, and enabling you to download the contents of your cloud drive in one go, it doesn't do much. You can browse through your files online or share individual files via email, but there are no document-preview or media-playback features built in. Its one saving grace is that the tools for navigating and sharing photos are reasonably good.

The service is reasonably speedy, downloading our 500GB of test files in less than seven-and-a-half minutes, but the lack of synchronisation and the limited feature set make this a moot point. Nor is pricing all that competitive; 100GB

will cost you approximately \$8 more per month than on OneDrive, while 1TB on Dropbox will cost you a quarter of what it will on Cloud Drive.

If Amazon wants to succeed in this competitive market, it really needs to do more – and do it better.

KEY SPECS

www.amazon.com

5GB, free; 20GB+, from \$10/yr;

OVERALL



Apple iCloud

A VITAL PART OF APPLE'S ECOSYSTEM AND ESSENTIAL FOR IPAD, IPHONES AND MACS - BUT A TOUCH EXPENSIVE

Rather than a straight cloud-storage service, Apple iCloud is a bundle of services that enables iOS devices to work more effectively with each other, and with OS X and Windows PCs. While it's now integrated into iOS 8.2 and OS X Yosemite, and is fast becoming the primary means of backup on the former, a combination of web-based apps and a Windows client give it some useful applications on Windows systems as well.

Mail, contacts and calendar data sync with desktop Outlook, while online versions of Apple's iWork office apps mean you can start a document on your iPad then edit it on your PC. You can browse, download and edit photos using Apple's Photo Stream service, and finally upload files from all your PCs and iOS devices to iCloud Drive.

iCloud Drive handles the grunt work of sync and storage, syncing iCloud Drive folders across your computers and online in the cloud. The Windows client shows



▲ The online version of iCloud apes the style of iOS 8 point

Apple's usual clean design and is easy to use, while the online version apes the style of iOS 8. The only problem is that the features are fairly limited. You can download music or documents, but you can't preview or stream them online, while browsing photos simply opens them up in a new browser window.

iCloud is a great service for backing up your iOS devices, getting photos from your iPhone and onto your PC, or syncing data with Office. Unfortunately, it isn't as feature rich or flexible as rivals. Predictably, there's no support for Android or Windows Phone, file- and folder-sharing features are all but non-existent, and it's neither a particularly cheap nor

particularly fast. The monthly fee for 1TB is more than double that of OneDrive, and significantly beyond what you'd pay on Google Drive or Dropbox. Given that all three offer stronger cross-platform support, iCloud is likely to appeal only if you want to work exclusively with Apple hardware.

KEY SPECS

www.apple.com

5GB, free; 20GB, \$1.29/mth; 200GB, \$4.99/mth; 500GB, \$12.99/mth; 1TB, \$24.99/mth

OVERALL



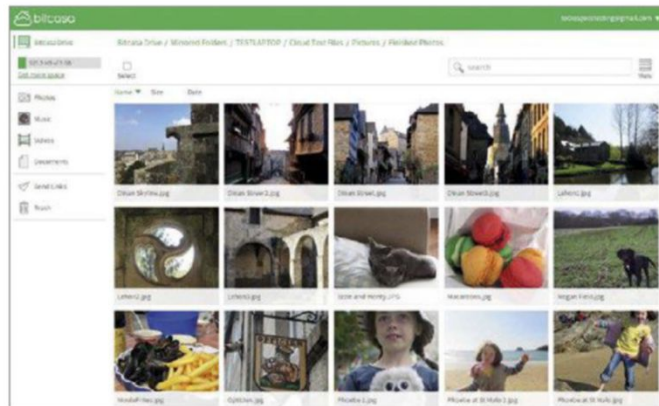
Bitcasa Drive

A NEW TAKE ON CLOUD STORAGE WITH STRONG PRICING, BUT IT'S UNDERMINED BY A POOR SPREAD OF FEATURES

Bitcasa Drive does things differently to other cloud-storage services; instead of syncing folders between PCs and online with a folder in the cloud, all files are broken down into chunks and encrypted before they're uploaded and stored on a Bitcasa "hard drive" in the cloud. From there you can access them from any system via an app, a browser or a desktop client.

When you need them, files are streamed from the online drive and cached, making it faster to get hold of them next time. This makes Bitcasa more effective for those moving between a conventional desktop or laptop and a tablet with limited storage.

You can't sync files as such, but you can mirror files from one linked PC to the Bitcasa Drive, then access those files on any other linked PC. Changes you make to the master version will sync across



◀ You can mirror files from one linked PC to the Bitcasa Drive, then access them from any other linked PC

to the Drive, and from there to the other PCs. There's a price to pay in terms of performance, since dismantling your files and restoring them takes time, but it isn't too bad, and files synced with the Bitcasa Drive reflect any changes within seconds of alteration.

Bitcasa is supported by some well-designed mobile apps, which offer previews of most mainstream document formats, plus streaming of photos, audio and video files. Where possible, files are transcoded on the fly, so you can view, say, video files on an iPad that aren't normally supported. The browser-based interface can manage similar tricks, while a simple, discrete client makes uploading and

downloading files easy.

Aside from speed, Bitcasa's other failing is its lack of comprehensive sharing features. You can only send other people a link to a file, which they can then access whether they use Bitcasa or not. Bitcasa is competitive on price, but we'd look elsewhere for simple file storage.

KEY SPECS

www.bitcasa.com/personal

5GB, free; 1TB, \$10/mth or \$99/yr; 10TB, \$99/mth or \$999/yr

OVERALL



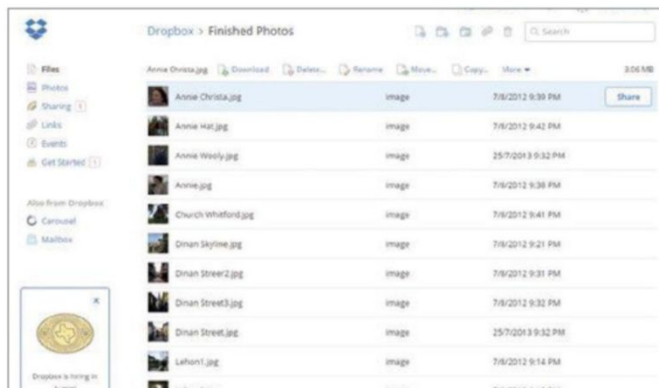
Dropbox

STILL A VIABLE CONTENDER FOR THE BEST ALL-ROUND SERVICE, DROPBOX IS A BRILLIANT COLLABORATION TOOL

For many, Dropbox is synonymous with cloud storage, sync and file sharing. It's the service that all other services are inevitably compared to, and there's good reason for that. For one thing, Dropbox is incredibly easy to use. All files dragged into a Dropbox on one PC are replicated in the Dropbox folder on all PCs, and no other service makes sharing files and folders quite so simple.

The revamped system-tray applet does a great job of notifying you when there are updates, or staying out of your way when you just want to get on. It's virtually hassle-free, and the LAN-sync features are great for keeping several computers in sync across the local network.

Dropbox also offers a great range of features. In the browser you can upload, download, share and reorganise files without any problems, and the tools for previewing documents and handling media mean there's a lot you can do



◀ You can upload, download, share and reorganise files from a browser



without downloading anything. Dropbox apps are ubiquitous across all major mobile platforms, and the service is supported by a huge range of third-party mobile apps. You can tap on a file within Dropbox and be editing it within the mobile Microsoft Office apps, or a number of other office apps, within seconds.

Sync speeds are generally fine. Even if Dropbox struggled overall to keep up with Livedrive, Box and OneDrive, it's far from iCloud or even Google Drive territory. Download speeds are disappointing, however, with Dropbox taking twice as long as some rival services to download 500GB of test files.

Overall, though, Dropbox misses out on

an award simply because the competition offers better value. While there are many ways to increase the 2GB of free space, it isn't much when Microsoft and Google are offering 15GB. Dropbox is still a fantastic cloud-storage solution, and well worth considering if you need to work across different platforms, but OneDrive and Box have the edge.

KEY SPECS

www.dropbox.com

5GB, free; 1TB Dropbox Pro, \$10.99/mth

OVERALL



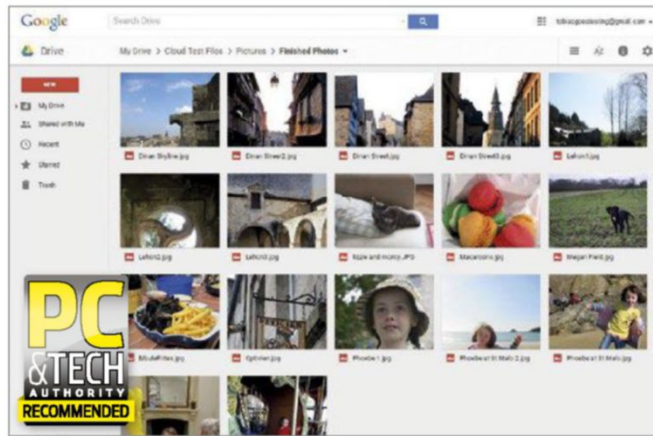
Google Drive

STRONGER THAN EVER, AND GOOD VALUE, TOO – BUT LAGS BEHIND THE BEST WHEN IT COMES TO SYNC SPEED

Google Drive keeps getting better. The service that once struggled with a lack of key features and an ugly, unintuitive interface has improved dramatically in recent years, with a slicker, more informative desktop client, a better browser experience and stronger apps.

Google has taken a leaf out of Dropbox's book on the desktop. Syncing files has always been as easy as dragging them into the Google Drive folder set up on your desktop, and now status updates keep you abreast of every upload and download. The browser-based interface can look messy, particularly if you don't tend to organise your documents in folders, but Google's usual focus on search ensures that nothing is hard to find. Google's document-preview features are excellent, too, with photo and music-streaming features that aren't far behind.

Drive's biggest strength is its position in



◀ Google Drive has excellent preview features



Google's ecosystem. It's the default place to save files on Chrome OS and a natural choice for Android users, where having the Google Drive app is a given. What's more, it's closely integrated with Gmail and Google's Docs, Sheets and Slides office apps, making it easy to edit or collaborate on files from anywhere with anyone at any time. This alone means you'll probably use it if you have a Chromebook or an Android tablet, and the excellent iOS app means it's also a perfectly viable cross-platform option. There is no Windows Phone 8 support.

Google Drive is good value, and the generous 15GB of free capacity could be all the cloud-based storage some users will

ever need. But while its download speeds are reasonable, it was a little slow to sync, often taking five to ten seconds longer than Box or OneDrive to replicate new or amended files. That isn't going to put it out of contention, but when you weigh up performance, cross-platform support and ease of use, Drive's rivals come out ahead.

KEY SPECS

www.google.com/drive

515GB, free; 100GB, US\$2/mth; 1TB, US\$10/mth

OVERALL



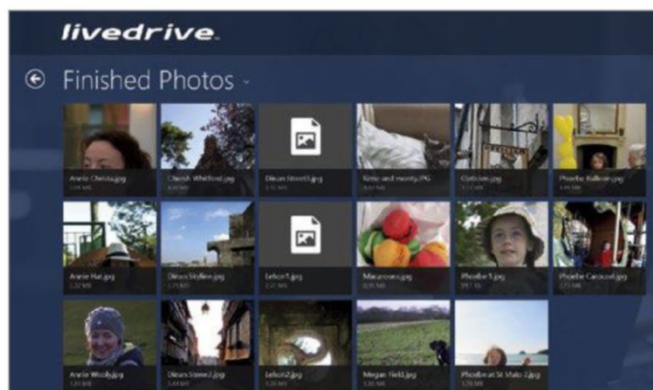
Livedrive

A SMART, VERSATILE CLOUD SERVICE AT A TEMPTING PRICE, BUT THE INTERFACE LOOKS AND FEELS A

Livedrive gives you a choice between a basic online backup service, a 2TB sync service, and a service that bundles both together, covering five PCs with 5TB of storage. You can select which files and folders to back up, and can drag files and folders to be synced into your Briefcase folder, which operates like a Dropbox folder.

Livedrive's desktop client looks dated, and its Android and iOS apps are even worse. As features go, though, the software isn't bad. Selecting files and folders for backup is easy, with the setup making sensible suggestions, and you can select whether individual files or folders sync on specific systems within the desktop client. There's also a useful option to have synced PCs or laptops exchange data peer-to-peer over a local network.

You can stream music, photos and even video within the iOS app, although the Android version is noticeably less capable. There's even worse news for Windows



◀ Livedrive's desktop client looks dated – and the apps are even worse

Phone users, with no app available to cover them. The browser-based interface could do with slicker photo-browsing and media-handling features, while document support is limited to opening and editing files within Zoho's online office suite.

Performance is Livedrive's biggest strength. It was the fastest to sync of all the services, spotting changes and uploading then downloading the revised file a few seconds faster than most rivals. Its download speeds weren't quite so impressive, but it was still quicker than Dropbox, iCloud and Bitcasa. What's more, the pricing can be very attractive – be warned, though, that Livedrive's headline pricing is usually worked out on a two-year

up-front basis. Monthly payments work out more expensive.

Livedrive is a solid and flexible service that rivals the bigger names on features, performance and value for money. However, OneDrive, Google Drive and Dropbox have the edge on features, mobile app support and ease of use.

KEY SPECS

www.livedrive.com

Backup only, £5/mth; 2TB sync only, £10/mth; 5TB backup and sync, £15/mth

OVERALL



THE AMAZING

LINDY

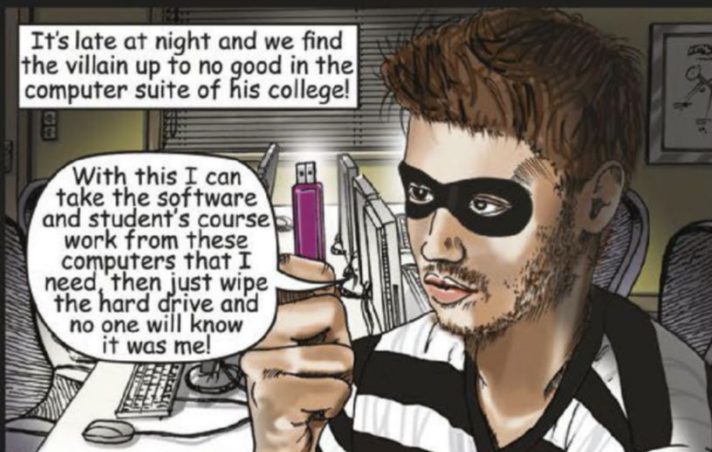
LINDY®
CONNECTION PERFECTION



WHATEVER THE PROBLEM, SHE'S HERE FOR YOU AND SHE ALWAYS DELIVERS!

It's late at night and we find the villain up to no good in the computer suite of his college!

With this I can take the software and student's course work from these computers that I need, then just wipe the hard drive and no one will know it was me!



I'm sick of being told that I am lazy and good for nothing, this'll shut them all up!

That's one way of getting better grades!



The next day as planned the result is complete chaos and panic!!

The software keeps crashing!

Same for me

Me too!

Months of work, it's just vanished!

I don't understand I seem to have lost all my course work!



Now I can return all those files



LINDY USB PORT BLOCKERS

LINDY can prevent this happening again!

THE LESSON TODAY IS NOT ALL DATA THEFT IS CARRIED OUT ONLINE!!

A HAPPY ENDING... WELL FOR SOME OF US!

WWW.LINDY.COM.AU

CABLES, CONNECTORS, HEADPHONES AND MORE...MUCH MORE!

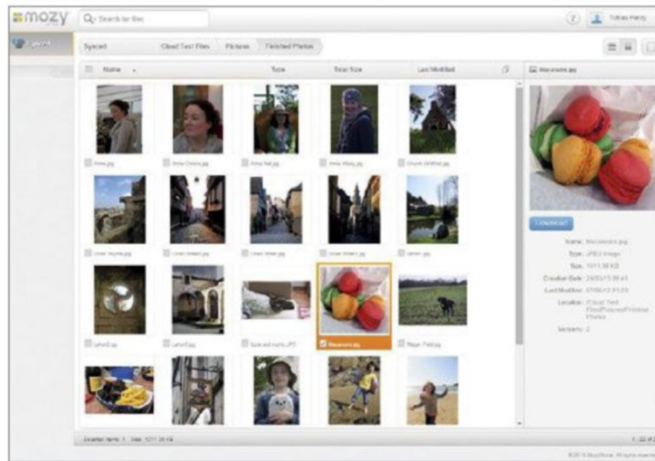
Mozy

STRONG ONLINE BACKUP, BUT NOT AMAZINGLY VERSATILE ELSEWHERE, WITH LIMITED SYNC FEATURES

Mozy made its name as an online backup service, but now offers sync services on top. The most basic service still only covers one PC for US\$5.99 per month, but \$US9.99 per month buys you 125GB of backup space for three computers, including sync from a dedicated MozySync folder.

In practice, the implementation is a little clunky in comparison to SugarSync or Livedrive. Where these provide both backup and sync from one desktop client, Mozy installs two: one to cover backup, and another for sync. Both clients are easy to use, with clear status updates and access to preferences, but also rather basic – a statement that covers Mozy as a cloud-storage service in general.

While apps are available for Android and iOS, they're rather spartan-looking and limited in terms of features. You can't stream music or edit office files on either platform, and the in-app document-preview features are reserved for iOS.



< The Mozy client is easy to use, but rather basic

What's more, there are no Windows Phone or Modern Windows apps. The browser-based interface, meanwhile, offers no features beyond basic uploads and downloads, and there's no support for sharing files with other users. In short, Mozy simply can't match the kind of versatility provided by Dropbox, Google Drive or OneDrive.

Mozy fares better when it comes to performance. Stored files downloaded faster than with any other service, and its synchronisation speeds were above average. Overall, though, we'd rather wait a few more seconds for a download and

have a service with a stronger feature set. Mozy is still a good choice for online backup, but sync doesn't appear to be its game. If you're looking for a more versatile cloud-storage service to work across your devices, we recommend you look elsewhere.

KEY SPECS

www.mozy.com

50GB, 1 PC, US\$5.99/mth; 125GB, 3 PCs, US\$9.99/mth

OVERALL



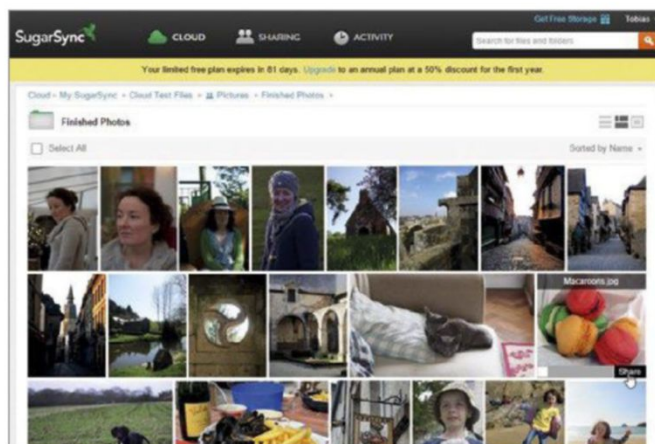
SugarSync

EASY TO USE AND PACKED WITH FEATURES, BUT IT'S HELD BACK BY POOR PERFORMANCE AND HIGH

SugarSync has long been one of the stronger challengers to Dropbox, OneDrive, Google Drive and Box, offering online backup, cloud storage and file sync at a time when the other major services didn't offer the full set. Last year brought a slick new look, new features and some price reductions, so it should be even better equipped to compete.

There's plenty to like about SugarSync. The revamped desktop client is clear, colourful and easy to use, and the sync features offer more control than rivals, making it simple to select which files and folders you want to keep in sync and across which linked PCs. It doesn't even matter if they're outside the Dropbox-like My SugarSync folder; all items can be synced in place. Files are easily accessible online, complete with the past five versions, although you can't preview documents or stream music and videos direct from your browser.

You can, however, if you use the Android



< Photos are neatly pulled out of their folders to be browsed and viewed

and iOS apps, which closely mirror the look of the new desktop interface. There are excellent document-preview features, covering common Office formats and PDFs, music streams flawlessly, and photos are neatly pulled out of their folders to be browsed and viewed.

Unfortunately, SugarSync falls out of the running on two counts. First, there's no free option beyond a 5GB 30-day trial, and the paid-for plans aren't particularly cheap, even with a two-month discount if you pay up front for the first year. Second, it's slow. Our 500GB of test files took almost half an hour to download – a shock

when most services took well under ten minutes. Sync speeds were reasonable, by comparison.

SugarSync has the design and features to be a real contender, but it really needs the back-end performance to match.

KEY SPECS

www.sugarsync.com

100GB, US\$7/mth or US\$75/yr; 250GB, US\$10/mth or US\$100/yr; 500GB, US\$25/mth or US\$250/yr

OVERALL



View from the Labs

CHOOSING A CLOUD-STORAGE SERVICE CAN BE TRICKY, FINDS **STUART ANDREWS**, BUT THE GOOD NEWS IS THAT QUALITY AND FEATURES ARE IMPROVING ACROSS THE BOARD

Picking a winner for this month's Labs was a challenge for a number of reasons: buying cloud storage doesn't only involve working out which service offers the best combination of capacity and features for your budget, it also means deciding which service is likely to best suit your devices and your particular way of working.

Spending money on Apple's iCloud system, for example, makes sense only if you're working exclusively across Macs, iPads and iPhones, while Google Drive and Microsoft OneDrive become more tempting if you're entrenched in an Android/Chrome OS or Windows ecosystem.

This is one area where Google and Microsoft have played things smarter than Apple. iCloud works brilliantly on OS X and iOS, where it's baked into the core operating system, but on Windows it feels like a kludge, and Android support is non-existent.

iCloud doesn't compete particularly well on value either, coming in more expensive than Amazon Cloud Drive, SugarSync and even the business service Box.

By contrast, Google Drive and OneDrive are integrated into the Android

and Windows platforms – and the former is an essential part of Chrome OS – yet they're perfectly functional on other platforms. Google Drive will work happily across Windows PCs, an iPad and an Android phone or tablet, while OneDrive offers a strong feature set and sensational value whether you use it on a Windows 8.1 laptop, an iPhone or a Nexus 7 tablet. OneDrive is emblematic of Microsoft's new, open, "services-first, platforms-second" approach, just as

"The desktop clients are becoming less intrusive, and the mobile apps are beginning to benefit from better design"

Google Drive is of Google's omnivorous attitude to the whole cloud-services market.

This doesn't mean there's no place for third-party services – far from it. Dropbox – once king of the cloud-storage services – might have fallen behind OneDrive and Google Drive when it comes to sheer value, but if you need to support collaboration across multiple platforms, locations and people, it's still a fantastic choice.

Livedrive offers a decent spread

of features and a low price, although its interface is feeling a little dated compared to this month's winners.

Finally, Box has done more to embrace smaller businesses while building a service that's less about mere storage, and more about supporting team workflows. For some smaller businesses and individuals, Box will be overkill – but it can offer micro-businesses and SMEs a new, more efficient way of working.

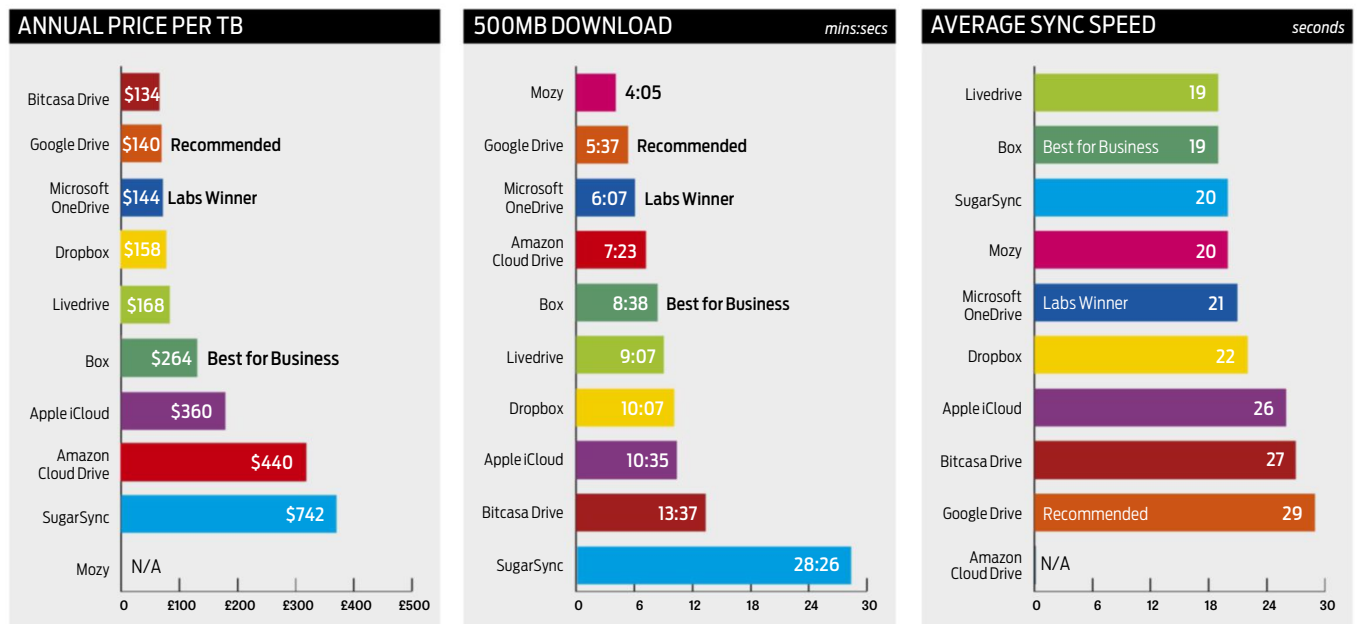
The encouraging thing is that all these services are continuing to improve. The desktop clients are becoming less intrusive and better at exposing functions and dishing out notifications. The accompanying mobile apps

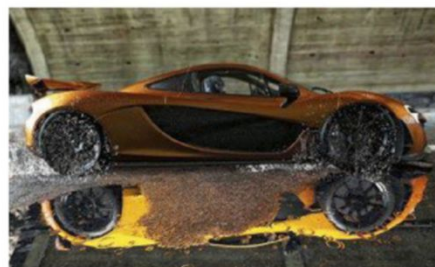
are beginning to benefit from better design, and are making more effective use of tablet screens. The web-based interfaces support a wider range of features, too.

These are services built to power a new style of IT, and support new breeds of cloud-focused laptops and PCs.

While concerns about privacy, security and regulations will continue to put off some people, cloud storage is maturing nicely, its pricing is generally acceptable and improvements continue. ●

Key data





Project CARS

VASTLY IMPRESSIVE RACING SATISFACTION, BUT IS IT A TRUE SIM?

Project CARS is the newest kid on the block of racing simulators. Developed by the same UK-based team which once headed the legendary GTR series on PC in the mid-2000's, Slightly Mad has in recent times been focusing on racing titles more geared towards providing fun for everyone with the Need for Speed Shift series. Project CARS, however, is earmarked as a return to the roots of what made this studio so well-known; a sim designed to be as realistic as possible and mix it with the best of the industry on both PC and console.

For the most part, Project CARS achieves this. Each of the 60+ cars available to drive in the game feel uniquely challenging to drive while also providing a selection of assists to use for those of us who aren't quite up to the challenge of these cars in their rawest form. For a game titled Project CARS, the relatively limited selection of cars may seem disappointing compared to the hundreds provided by the Gran Turismo and Forza series, but each one of these cars are rendered in great detail, both graphically and under the hood with how each of the cars drive. It's not like there's no variety either, with the car selections ranging from entry level 125cc karts all the way up to high speed formula cars, so you are still spoiled for choice in this area.

That being said, the cars themselves

do feel a little lacking physics-wise compared to its competition on PC. They feel a little simplified overall compared to their counterparts in Kunos Simulazioni's Assetto Corsa, especially when it comes to high speed losses of grip which can be saved effortlessly in pCARS. In addition, the everyday road cars provided in pCARS generally feel rubbish compared to the superb job done with them on the rival sim. That isn't to say that the racing-spec cars, which form most of the car list, aren't believable, as in the heat of an

on-track battle such nuanced differences can't really be noticed by a majority of gamers. But for the small niche of sim racers that have expensive racing wheels, the driving feel of pCARS will likely disappoint.

FEELING IT

The same can be said for the controls. Wheel support is great, supporting all the popular wheels from brands like Logitech, Fanatec and Thrustmaster. However, when it comes to force feedback effects,



GIGABYTE™

**GAME LIKE A
CHAMPION**



PC
TECH
OF THE YEAR
BEST MOTHERBOARD



pCARS is very lacking out of the box, with very little feel for the car and track being provided through the wheel. Even with community suggested settings improving this somewhat, I still can't get a good feel for the grip of the front tyres on my Logitech G27, which often leads to guesswork turning into corners. Low speed grip in general just feels off and is exacerbated by these force feedback issues. Tuning these options to your liking isn't easy either, with nearly two dozen options provided on force feedback across three different menus, making the task a pain. For those of you playing on gamepads, the default settings also feel too twitchy and floaty initially and require some extensive tweaking. This is surprising for a game being released on consoles and competing with console racing games, which mostly work perfectly out of the box on gamepads.

GAME MODES

What Project CARS does well is career mode. Project CARS offers you complete control of how your career progresses through the racing categories the game provides. You can start as a fresh faced kid in karts and work your way up over multiple seasons and multiple different championships to pCARS' Formula 1-esque series, Formula A, just like how F1 stars like Daniel Ricciardo have done in real life. Alternatively you could start in touring cars and work your way up to driving GT cars and prototypes at the iconic 24 Hours of Le Mans race. There is so much you can do here.

All of the races you attempt in the game are customisable as well. You can select to do full length practice, qualifying and race sessions or shorten them down to a few minutes each if you're in a bit of a rush to move forward. It is impressively in depth and leads the field for career modes in driving games, as it doesn't hold your hand and guide you in a certain direction. You set your own goals and challenges and do them as you wish. The only criticism I can have is that the AI can sometimes be a little erratic. While they mostly are fun to drive against they tend to be a little too aggressive against human controlled players yet also too tame against other AI cars.

All these races can be done on the largest selection of tracks provided in any racing game currently available. There are over 100 different tracks to be raced on from over 30 different locations, including local favourite Bathurst. It is



an impressive list, but there are very few tracks included using high precision laserscan technology which accurately detects all the small bumps of a track. These laserscanned tracks are already standard for releases on Assetto Corsa and iRacing, meaning that the tracks they share in common with pCARS feel much more alive to drive on and actually look closer to how they actually look. That being said, the four British laserscanned tracks pCARS provides are fantastic and most of the other tracks provided are more than acceptable to race on.

ONLINE

The online multiplayer is messy. There is a decent experience to be had online, but only when racing on dedicated servers. Races hosted via peer-to-peer tend to be lag affected with bad collision detection and stability, which is a shame as this is the only option for online races on console. Actually finding dedicated servers on PC to race on is a pain as well, as there is no indication in the very limited server browser whether a session is on a server. In fact, there is little information provided by the browser in general unless you join a lobby, and servers can't stay online unless the server host is hosting lobbies on the server, which is a backwards system for those of us used to fully featured 24/7 servers on PC games.

pCARS also lacks a significant feature of many PC sims: mod support. While the game will be supported months into the future with paid additional DLC content, no user-created cars or tracks will ever feature. This limits the life

cycle of pCARS significantly, as other successful sims have lived long lives due to the constant stream of free, well made content by the community.

QUITE THE LOOKER

Visually, the game looks amazing on a powerful PC, with incredible time of day changes that very few racing games can compete against. However, pCARS is a performance hog when running with large amounts of AI or in wet weather, and only the best PCs can run the game at maximum settings at a stable framerate in it's most stressing situations. This is made even worse by the fact that AMD GPU users are experiencing very poor performance due to unoptimised drivers, with the top of the line R9-290X only performing at the level of a three year old mid-range nVidia card. This should be fixed in AMD's next driver release but at the time of writing it is hard to recommend the game for those on AMD hardware. Performance issues also plague the console versions, with the advertised stable 60 FPS framerate often dropping to half that in wet weather.

In addition, the flashy presentation of the menus also hide some functionality issues, especially in terms of changing options, car setups and watching replays. Other small bugs also exist including random game crashes, inconsistent corner cutting and penalty detection issues, but these should be patched in the near future.

Project CARS occupies a new niche in racing games. It is a step up in depth from previous games occupying the area between arcade and sim, notably the racing games from Codemasters, but it is not on the same level of top of the line sims. On its own terms it is a fun experience though, especially in its in-depth career mode. However, pCARS' multiple issues, especially with its graphic performance, controls, multiplayer setup and lack of mod capability stop it quite a way short of being the revolution it promised to be for racers.

Justin Talent

KEY SPECS

www.projectcarsgame.com

Genre - Racing • Developer - Slightly Mad Studios • Publisher - Slightly Mad Studios • Platform - PC, PlayStation 4, Xbox One, Wii U

OVERALL

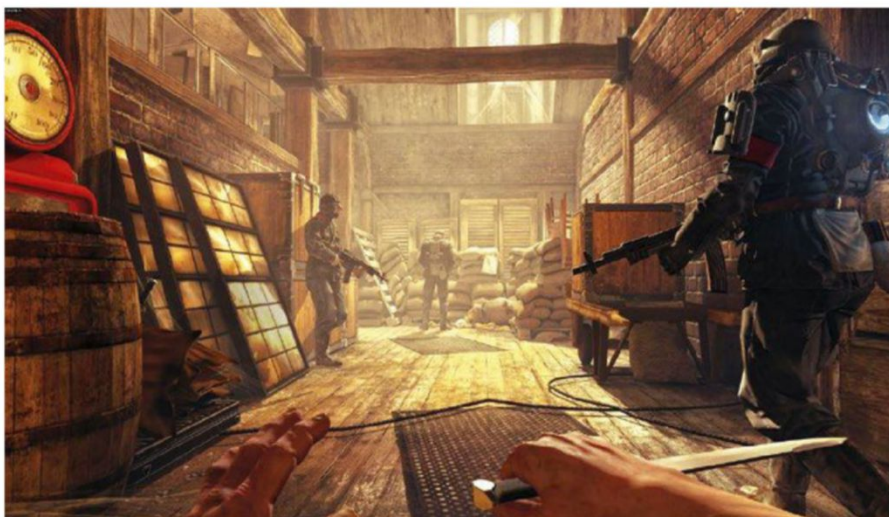


GIGABYTE™



GIGABYTE BRIX™
The Perfect Fit for Your Living Room





Wolfenstein: The Old Blood

CAN B.J. BLAZKOWICZ EVER CATCH A BREAK?

Nobody really expected Wolfenstein: The New Order to be the sleeper hit of 2014. What was initially expected to be little more than a generic Nazi filled shooter cashing in on a nostalgic name not only turned out to be one of the best straight up old-school first person shooters in years, it also proved to have well developed characters and a surprisingly deep and affecting story. Wolfenstein: The Old Blood, a five or so hour standalone prequel to The New Order is more akin to the early expectations of The New Order in that it rides more on fond memories of the earlier game than it does on its own merits. There are still some truly great moments to be had with some fun character interactions and combat set-pieces, but thanks to the constant breathless pace of the game and the jarring tonal shifts that happen for no good reason two thirds of the way through the game it comes off feeling more like a good covers band than the real thing.

Set in the 1940s, The Old Blood serves as a prologue, introducing players to the beginnings of the alternate history that made up The New Order. Players once again step into the Nazi hating boots of B.J. Blazkowicz, but rather than seeing the hero taking down the forces of Deathshead, The Old Blood instead tasks Blazkowicz with infiltrating the eponymous castle to gather information on a secret plan. Of course things don't go exactly to plan, so in amongst the Nazi

shooting there is also a prison escape, as well as zombies, because it appears to be the law that every game released must have a zombie area or at least a reference to the undead.

Not since Mario first leapt into action has a videogame character had such an affinity with plumbing. After the first, action packed 10 minutes, the first tool that Blazkowicz finds at his disposal is a pipe, and this becomes his trusted companion and go-to tool for the rest of the adventure. It works as a shiv for stealth kills, can be used as a club, a jemmy for opening doors or popping the power-plugs of massive armoured enemies, a prop for holding up portcullis even a pair of climbing spikes allowing the character to make his way up certain specified surfaces.

Other weapons of course become available throughout the adventure, including a silenced Luger, a meaty and satisfying "Shockhammer" shotgun, an assault rifle and sniper rifle, with most weapons being dual wield-able, Blazkowicz firing with both hands and spraying down enemies with streams of lead. Aside from being a great way to chew through ammunition, dual wielding is also good for taking down heavily armed or armoured enemies quickly.

The layout of The Old Blood is a good deal more streamlined and linear than that of The New Order, leading to a faster, more unrelenting pace to the game. While

this is great if you're simply looking for some unabashedly old-fashioned FPS action it lacks any real sense of flow - the tension is pretty much always cranked up the maximum leaving it feeling both breathless and a little hollow.

Due to the relentless pace, the shift from Nazi killing to zombie horror also comes across as rather flat. The undead storm-troopers are a nice callback to the 2001 Grey Matter Interactive developed Return to Castle Wolfenstein but add relatively little to the overall experience thanks to the fact that the only thing that really differentiates them from other Nazi enemies is that they take more bullets to put down.

Even with the problems with pacing, Wolfenstein: The Old Blood is still a thoroughly enjoyable, gleefully old fashioned FPS, revelling in a bit of the old ultraviolence. The fact that the game has production values that rival or surpass many other AAA games currently available and retails for around one third of the price is just icing on the cake.

Daniel Wilks

KEY SPECS

www.wolfenstein.com

Genre - Action • Developer - MachineGames • Publisher - Bethesda • Platform - PC, PS4, XBone

OVERALL



GIGABYTE



LASTING QUALITY

FROM GIGABYTE

GIGABYTE 9 Series
Ultra Durable™ Motherboards



Warhammer 40,000: Regicide

40K MEETS BATTLE CHESS IN A SURPRISINGLY SOLID COMBINATION.

Chess is one of those games that most people know how to play, and may even like playing – but very few of those people are actually good at it. It is the very epitome of easy to learn, hard to master, and when you are playing someone who's mastered the strategy, it can be one of the most brutal games imaginable.

Well, now it's getting a lot more brutal, with the addition of Orcs, exploding bolt-gun rounds, and power-armoured super-soldiers complete with jet-packs. That's the main thrust of the Warhammer 40,000: Regicide. It's an Australian-developed game that melds the moves of chess with the grimdark future-tech of Warhammer 40,000.

It's a lot like the classic Battle Chess, but there's a lot more to it than that. You can play in standard mode, where each piece moves as you'd expect, and taking other pieces is similarly straight from normal chess. The figures and animations, though, are pure 40K – Rooks are either heavily armoured Terminators, or bulky Orks in heavy armour. Knights

are Assault Marines or Stormboys, respectively, each armed with jump-packs – which plays into the Knight's unique ability to move over pieces. As you take a piece, a unique and often bloody animation plays out: Tactical Marine will gun down their opponent in a hail of bolt-shells, while the Marine Librarian – a powerful psyker, and the stand-in for the Queen on the Marine side – atomises foes with beams of psychic energy.

The clever matching of 40K troop types with chess pieces actually makes the game even more intuitive – if you come from a 40K background. Someone looking for a straight chess simulation may find the violence a little over the top (well, a LOT over the top).

But there's to the game than just Chess.

In Regicide mode, while unit movement remains the same, all kinds of new wrinkles are added to the game, bringing it more in line with traditional wargame titles. Units have armour and health ratings, can shoot at range, and have access to a range of special abilities. You can, for instance, move a Tactical Marine Pawn two squares, and still have him shoot an opponent at range, and then hunker down to make a harder target. You can toss grenades (great in the early game when pieces are bunched together), call down orbital strikes... All kinds of things.

The health system also gives pieces much more versatility, making mistakes far less lethal. Kings, in particular,

suddenly become hard to kill juggernauts. To mix things up even more, some scenarios, though played on the usual eight-by-eight chessboard, come with walls and other terrain to make use of.

The game is in early access at the moment, so the above is pretty much all you have to play with for now. But it's early days yet – there's a lot more content incoming, including a full campaign with unit progression, and more faction options. At the moment Marine players can choose between either the Blood Angels or White Scars, and Ork player can choose between Goffs and Death Skulls. We've heard hints from Hammerfall, the developer, that more skins for the factions – and even more factions – are part of the ongoing plan, and the developer certainly plans to offer a lot of ongoing support and content, even when the game comes out of Early Access.

The game's AI is not the strongest, often making moves that are tactical blunders in the classic mode. It's much sharper in Regicide, however, and if you want a real challenge, you can take on other players in direct matches, or even play by correspondence. Play by email doesn't suit every game, but it's a welcome option in Regicide.

If you're a fan of chess and the Warhammer 40,000 setting, Regicide is almost a must-buy, even at this stage. The clever animations and character choices, combined with multiplayer, make for an interesting diversion from using a standard set. The addition of Regicide opens the game up for those who aren't so fond of chess, but do like games such as Fallout Tactics or Heroes of Might & Magic.

It's a fresh take on a classic game, but with enough added layers of complexity that it never really feels like chess, except for the game's pacing, which is fundamentally the same.

If you don't mind getting into an Early Access game, it's definitely worth looking at closely.

David Hollingworth

KEY SPECS

www.warhammer40kregicide.com

Genre - Strategy • Developer - Hammerfall Publishing • Publisher - Hammerfall Publishing • Platform - PC



GIGABYTE

ALL NEW X99
CHAMPION SERIES

OVER 30 TOP SCORES AND COUNTING... INCLUDING 10 WORLD RECORDS.



The A-List

ONLY THE BEST OF THE BEST MAKE IT TO PC & TECH AUTHORITY'S A-LIST

For the first time in a few issues we've no changes to the hardware part of A-List. Next issue will see us spend a mighty week at the annual Computex show, and we have a few key areas of interest that may well see some seismic shifts on this page, and the next.

However we do see a new version of Adobe Lightroom come into the List, and what's more it's a higher scorer than its predecessor with a perfect 5 out of 5.



PC DESKTOP

ALL-IN-ONE
Apple iMac 27in

★★★★★

PRICE \$2,199

SUPPLIER www.apple.com/au

If you can afford it, the 27in iMac is the finest piece of all-in-one engineering on the market. A truly powerful beast with performance to match its looks..

SPECIFICATIONS 3.2GHz quad-core Intel Core i5; 8GB DDR3 RAM; 1TB Western Digital Caviar Black HDD; NVIDIA GeForce GT 755M 1GB; 27in 2560 x 1440 LCD.



PERIPHERALS

WIRELESS ROUTER Netgear
Nighthawk X6 AC3200

★★★★★

SUPPLIER www.netgear.com.au

Designed to keep pace with high-bandwidth content consumption, it is the router King.

SPECIFICATIONS 1GHz dual core processor with 3 offload processors, 6 High performance antennas, one 2.4GHz band and two 5GHz Wi-Fi bands

DESKTOP STORAGE CalDigit T3
with Thunderbolt 2

★★★★★

SUPPLIER www.amazon.com

The T3 is an expensive RAID device, but when you factor in the drives and the capacity included, it's good value.

SPECIFICATIONS 6/9/12/15TB external hard disk with RAID; Thunderbolt and Thunderbolt 2, 135 x 241 x 116mm 4.5kg.



NAS Synology
Diskstation DS415play

★★★★★

SUPPLIER www.synology.com

For most home users, the DS415play is very impressive. It's an all in one box that can literally do it all.

SPECIFICATIONS 24x SATA 3.25"/3.5" drive bays - Intel Atom Dual Core 1.6GHz CPU - 1GB DDR3 RAM - 2x USB 3.0 & 3x USB 2.0 - 1x Gigabit Ethernet

ALL-IN-ONE PRINTER
Canon Pixma IP 8760

★★★★★

SUPPLIER www.canon.com.au

This Canon can do it all, and at a reasonable price.

SPECIFICATIONS 9600 x 2400dpi print; 2400 x 4800ppi scan; USB 2; 802.11n WLAN; 150-sheet tray

LASER PRINTER Dell B1160w

★★★★★

SUPPLIER www.dell.com.au

The best all-rounder in our printer group test, with excellent text printing and decent costs.

SPECIFICATIONS 1800 x 600dpi resolution; USB 2; Wi-Fi; 150-sheet input trays; 331 x 215 x 178

LAPTOPS



VALUE Asus TF103C

★★★★★

PRICE \$429

SUPPLIER www.asus.com.au

While ostensibly a tablet with a removable keyboard, it also fits tidily into the value portable category thanks to its immense usability and remarkably low price.

SPECIFICATIONS Quad-core 1.86GHz Intel Atom Z3745 • 1GB RAM • 8GB/16GB eMMC storage • 10.1in 1,280 x 800 IPS display • dual-band 802.11n Wi-Fi



PERFORMANCE Aorus X7

★★★★★

PRICE \$2,999

SUPPLIER www.aorus.com

Super-sleek, light, outrageously powerful and with a spec-list that outclasses many high end desktop systems.

SPECIFICATIONS Q4-3.4GHz i7-4700HQ • 4GB/8GB DDR3L 1600, 4 slots (Max 32GB) • 17.3" Full HD 1920x1080 • NVIDIA® GTX 765M SLI GDDR5 4GB • mSATA 128GB/256GB, 2slot 2.5" HDD 500GB/750GB/1TB 5400rpm



PROFESSIONAL Apple Macbook Pro Retina

★★★★★

PRICE \$2,499

SUPPLIER www.apple.com/au

We've selected the 2.9GHz i5 model with 8GB of RAM and a 512GB SSD. Doubling the RAM adds another \$280. Some may find, though, the 13in screen size to be limiting.

SPECIFICATIONS 2.9GHz Intel Core i5; 8GB RAM; 512GB SSD; 13in 2560 x 1600 LCD; 2 x USB 3; 2 x Thunderbolt 2; dual-band 802.11ac abgn Wi-Fi



ULTRA PORTABLE Microsoft Surface Pro 3

★★★★★

PRICE \$1,549

SUPPLIER www.microsoft.com.au

Attach the Type Cover 2 and it's as good, if not better, than any 'proper' ultra portable laptop. It took three versions, but Microsoft has nailed this format. At least an i5 is recommended.

SPECIFICATIONS 1.9GHz Intel Core i5-4300U; 12in touchscreen (2160 x 1440); 8GB RAM; 256GB SSD; 802.11ac/abgn; Bluetooth 4

HANDHELDS

SMARTPHONE Samsung Galaxy S6

★★★★★

PRICE \$999

SUPPLIER www.sony.com.au

If only the best will do, look no further: the Samsung Galaxy S6 is the best smartphone on the market.

SPECIFICATIONS 2.5GHz Qualcomm Snapdragon Octa-core 2.1GHz/1.5GHz ARM Exynos 7420 SoC • ARM Mali-T760 GPU • 3GB RAM • 32/64/128GB storage • 5.1in 4K video • 2,550mAh battery • 1yr RTB warranty • 71 x 6.8 x 143mm (WDH) 1138g



TABLET Apple iPad Air 2

★★★★★

PRICE \$539

SUPPLIER

www.apple.com/au

The iPad Air 2 is definitively the best tablet on the market right now, and rightfully replaces its predecessor on our A-List.

SPECIFICATIONS 1.5GHz Apple A8X SoC • 2GB RAM • 16/64/128GB storage • 9.7in 1,536 x 2,048 IPS display • 7,340mAh battery



EBOOK READER Kindle

★★★★★

PRICE \$109

SUPPLIER

www.amazon.com

The new model is quicker, slimmer, lighter and cheaper than before. If all you want to do is read books, its simple design and performance are perfect.

SPECIFICATIONS 6in e-ink screen, 170g weight, 114 x 87 x 166 mm, 2GB memory, 10-day battery life • WEB ID 279534



SOFTWARE

SECURITY Norton Security 2015

★★★★★

SUPPLIER www.norton.com/security

Great malware protection and equally good legitimate software recognition

BACK UP Acronis True Image 2015

★★★★★

SUPPLIER www.acronis.com.au

The 2015 version adds full-system backup and dual backup and unlimited cloud storage.

OFFICE SUITE Microsoft Office 365 Home Premium

★★★★★

SUPPLIER www.microsoft.com.au

The easiest to use Office to date.

WEB DEV Adobe Dreamweaver CS6

★★★★★

SUPPLIER www.adobe.com.au

This edition makes PHP and CMS its core focus.

AUDIO Cubase 7.5

★★★★★

SUPPLIER www.steinberg.net

The addition of better filters solidifies this program's continued place on the A-List.

VIDEO Sony Vegas Movie Studio HD Platinum 11

★★★★★

SUPPLIER www.sony.com.au

May not have the bells and whistles of other consumer editing packages, but its tools are efficient.

PHOTO Adobe Photoshop Lightroom 6

★★★★★

SUPPLIER www.adobe.com.au

Lightroom 6 doesn't add up to a revolutionary update, but it improves on what was already an exceptional piece of software.

NEW

The Kitlog

DREAM BUILDS WITH REAL GEAR

Despite having reviewed several interesting new monitors in recent months, the screens we have stay. There's no much action in screens right now, what with 4K, curved, 21:9 aspect ratio and gaming technologies FreeSync and G-Sync coming into the fore. But as yet we're still to see the perfect fusion that's able to knock our current placeholders off their perch.

THE GAME BOX

CPU



INTEL CORE I5 4690K

PRICE \$324

Ripping along at a stock speed of 3.5GHz, this 'K' model allows easy overclocking for even more performance.

MOTHERBOARD

ASUS ROG RANGER

PRICE \$279

Fully featured, extremely well engineered. Alternatively, the MSI Gaming 7 or Gigabyte Z97X-UD5H are equally as good at the same price.



MEMORY



KINGSTON HYPERX BEAST 16GB

PRICE \$219

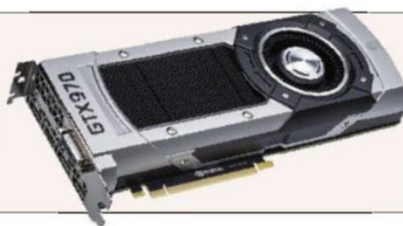
Our roundup award winner, it's well-priced, fast and overclocks very well.

VIDEOCARD

NVIDIA GTX 970

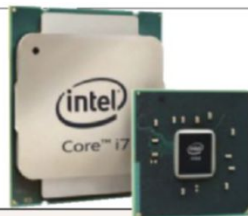
PRICE \$500

Quiet, sips power, but when the performance is needed this blazer eats up the frames.



THE PERFECT PC

CPU



INTEL CORE I7 5820K

PRICE \$535

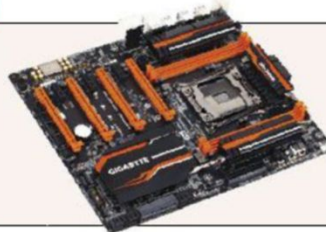
Six cores, plus an additional six Hyper-Threading cores.

MOTHERBOARD

GIGABYTE X99 SOC CHAMPION

PRICE \$420

Supreme engineering and component quality for rock solid reliability.



MEMORY



CORSAIR DOMINATOR PLATINUM CMD32GX3M4A2133C9 32GB

PRICE \$640

These memory chips are hand selected and tested, and 32GB of fast RAM will keep things smooth and fast in intensive tasks.

VIDEOCARD

NVIDIA TITAN X

PRICE \$1599

The Titan X is undeniably the fastest single-GPU product on the planet. If you want a product that doesn't need updated multi-GPU drivers to thrive, the Titan X is the one.



TOTAL: \$3013 RIG ONLY: \$2205

COOLER



COOLERMASTER NEPTON 140XL

PRICE \$120

Easy to install AIO CPU cooling, relative quiet and performance to rival twin-radiator units.

CASE



BITFENIX RONIN

PRICE \$99

BitFenix continues to deliver great budget cases that look terrific and are easy to build in.

SYSTEMDRIVES

SAMSUNG 850 PRO 512GB

PRICE \$449

Samsung's newest SSD offers greatly improved durability. Supplement it with a hard drive of your choice if needed.



KEYBOARD

CORSAIR K70

PRICE \$170

The glorious perfection of mechanical keys with well thought-out gamer design.



DISPLAY



LG IPS277L

PRICE \$499

27 inches of IPS glory. The resolution isn't perfect, but the price is. The thin bezel makes this a very attractive screen.

MOUSE



RAPOOH V900

PRICE \$69

Accurate, good lift-off performance and decent ergonomics at a fairly amazing price.

AUDIO

TT ESPORTS CRONOS

PRICE \$80

Fantastic set of headphones that delivers great 2.1 audio for gaming and music without swamping you with bass.



SOUND BLASTER X-FI XTREME

PRICE \$80

The best positional game audio at this price and good music quality.

POWER SUPPLY

COOLER MASTER G750M

PRICE \$125

Outstanding value for money, it's powerful enough for even performance PCs packing twin GPUs.



TOTAL: \$6203 RIG ONLY: \$4951

COOLER



CORSAIR H100i GTX WATER COOLER

PRICE \$179

Excellent cooling that is easy to install with advanced monitoring.

CASE



CORSAIR GRAPHITE 380T

PRICE \$259

Lovely form and brilliant function along with the highest quality.

SYSTEMDRIVES

SAMSUNG 850 PRO 1TB SSD

PRICE \$749

Our Labs winner is fast and durable with a wide choice in capacities.



SEAGATE BARRACUDA 2TB

PRICE \$100

Supplement the PRO with cheap HDD storage.

KEYBOARD

CORSAIR VENGEANCE K95

PRICE \$189

The perfect keyboard. Lovely Cherry Red mechanical switches, a slick and attractive aluminium body and customisable backlighting make this The One.



DISPLAY



ASUS PB287Q

PRICE \$719

A fully-featured 4K monitor with near-perfect colour accuracy for under \$800.

MOUSE



CM STORM REAPER

PRICE \$85

Very solid and feels fantastic under the hand with sweet on-screen movement.

AUDIO

CREATIVE SOUND BLASTER ZXR

PRICE \$289

Superb music and general audio, with the versatility of a comprehensive set of connectivity options.



POWER SUPPLY

CORSAIR HX1000i

PRICE \$299

Corsair's mighty HX1000i pumps out extremely reliable power, even when under full loads.



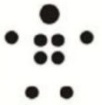
SUBSCRIBE FOR YOUR CHANCE TO WIN 1 OF 10 BELKIN WEMO SWITCHES WORTH \$69.95

SUBSCRIBE TO *PC & TECH AUTHORITY* THIS ISSUE AND YOU'LL GO INTO THE DRAW TO **WIN 1 OF 10 BELKIN WEMO SWITCHES WORTH \$69.95**

The WeMo Switch is a small device that plugs directly into any electrical outlet and serves as the main building block for the WeMo ecosystem. Once the Switch is connected to the home Wi-Fi network, any device plugged into it can then be turned on or off from anywhere, whether at home or on the go with the WeMo app. The app also enables users to put devices on a timed schedule, so devices will turn on or off at pre-set times..

- Turn electronics on or off — from anywhere
- Operates over Wi-Fi and mobile internet, at home and away
- You've already got everything you need: WeMo works with your existing Wi-Fi router and any Android device, or iPod touch, iPhone, iPad - iOS 5 or higher
- Put your electronic devices on a schedule
- Modular system. You can add additional WeMo Switches easily, any time
- Control as much or as little of your home as you want to
- Plugs into any regular 240v wall outlet
- Intuitive, easy set up. Easy to use
- Free WeMo app



wemo™  belkin.
WWW.BELKIN.COM.AU

PC & TECH AUTHORITY DIGITAL EDITIONS

If you'd prefer to read us on your mobile, tablet or computer, you can also now purchase a digital edition of the magazine! Visit au.zinio.com/pcta or itunes.com/app/pcandtechauthority



12 ISSUES FOR JUST \$75

Subscribe to **PC & Tech Authority** today and you'll receive 12 issues for only \$75 - that's just \$6.25 an issue! You'll have a year's worth of magazines delivered direct to your door, and **SAVE OVER \$44 ON THE COVER PRICE!**



Subscribe online at www.mymagazines.com.au or call 1300 361 146

Price offer available to Australian residents only. NZ – 12 issues A\$89.95, overseas airmail – 12 issues A\$127 – international callers +612 9901 6111. Offer ends 12/7/15. Prices include GST. Savings based on total cover price. Minimum subscription term is 6 months. Your subscription will start with the next available issue. Competition open to Australian and NZ residents subscribing to PC & Tech Authority between 00:01 AEST 8/6/15 and 23:59 AEST 12/7/15. 10 lucky winners will receive a Belkin WeMo switches, valued at \$69.95 each. Total prize pool is \$699.50. The winners will be drawn at the Promoter's premises on 21/7/15. Please allow 6-8 weeks for delivery of your first magazine, and separate delivery of the prize (after 21/7/15). The Promoter is nextmedia Pty Ltd, 207 Pacific Hwy, St Leonards NSW 2065 ABN 84 128 805 970. NSW Permit No. LTPM/14/01394, ACT Permit No. TP 14/04530. Full Terms and Conditions can be found at www.mymagazines.com.au.

THE BACK SECTION

Real world experience, the newest of the new in tech and some strong opinion

DOUBLE YOUR WI-FI SPEED Well worth doing **87**



HONEYBALL This month... Microsoft! **100**



BITCOIN: WHAT'S NEXT Actually useful? **94**



SOCIAL MEDIA SECUIRITY protect yourself from malware **108**

Your conversation history will self
destruct in 8 seconds



Cancel

Erase now

KILLER BUSINESS APPS Big gains for peanuts **90**



ALUMINIUM ION BATTERIES Next-gen power **97**



BEST MEDIA STREAMERS Paul Ockenden **103**





HOW TO DOUBLE YOUR WI-FI SPEED

Annoyed by a sluggish wireless connection? **Darien Graham-Smith** explains how to spot what's causing the problems - and how to solve them

If your connection is crawling along, the first question to ask is whether it's really the network that's to blame. The true culprit could be a specific program or device clogging up your network - perhaps a backup job beaming terabytes of data to your NAS box, or an infected device that's been subsumed into a botnet, and is now, without your knowledge, flooding out malicious datagrams to destinations all around the world.

With free software such as Wireshark (wireshark.org), you can inspect all the data packets on your network as they fly through the air, and easily discover whether one device is taking up more than its fair share of bandwidth. Your router's web-based administration interface may also offer reports and logs: the way you access these will differ between models and manufacturers, but they're well worth looking at since they'll also include activity from wired clients.

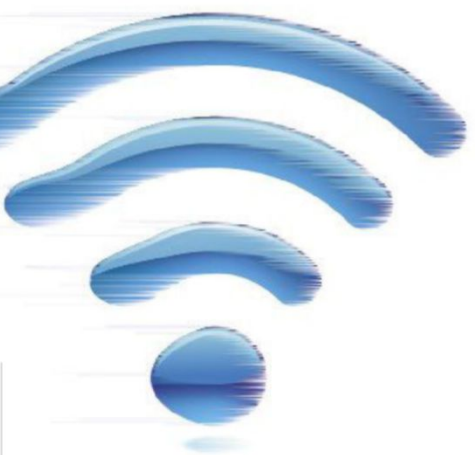
Don't assume that you know about every device on your network: if your network is open, or has a guessable password, your neighbours or others

could be leeching bandwidth and hoping you won't notice. You can boot them off, or use your router's QoS settings to prioritise the traffic that's especially important to you.

If all that sounds like too much hassle, try simply switching off your network-connected devices one by one, and keep checking network speed as you go. For obvious reasons, an online speed-tester isn't the right tool for this, as results will be limited by the speed of your internet connection rather than your domestic wireless network. Don't trust the wireless link speed reported by Windows either: this gives an idea of the theoretical throughput of your wireless connection, but if you're interested in real-world performance, there's no substitute for copying files back and forth between devices. If switching off a spare PC causes things to suddenly start zipping along, it suggests a little housekeeping may be all that's needed to give your wireless network a boost.

CHANGING THE CHANNEL

If you accepted the default settings when installing your router, your wireless network is probably sending and receiving data in the 2.4GHz band, and specifically



on channel 1, 6 or 11. This means packets are broadcast and received over a fairly wide radio band, centred on 2,412MHz, 2,437MHz or 2,462MHz.

These frequencies have been a standard part of the 802.11 wireless protocol since its introduction in 1997, so using them as defaults ensures that pretty much every Wi-Fi device in your home (and, indeed, in the world) should be able to talk to the router.

The downside is that if you live in a dense urban area, such as a block of flats, your neighbours' networks will be using these frequencies too, resulting in interference that slows down the connection for everyone. Other electrical appliances such as cordless phones and wireless video extenders may use these channels as well. And while microwave ovens are normally well shielded, these too can generate radio "noise" at frequencies in the 2.4GHz range, which is highly disruptive to radio communications.

The simplest answer is to switch your network to a different frequency. Your router's settings page should provide a dropdown allowing you to switch to a different channel within the 2.4GHz band - they're numbered from 1 to 13. Experiment by changing this to see whether one end of the spectrum provides a better connection than the other: your devices should automatically rediscover the network and reconnect soon after you change the channel.

If you prefer a more methodical approach, use a free tool such as NirSoft's WifiInfoView (tinyurl.com/or9b62v), or a smartphone app such as Wifi Analyzer for Android (pcpro.link/249wifianalyzer). These will survey all the wireless networks within range and their relative signal strengths, so you can avoid them as far as possible. Remember, though, that such tools won't show up interference from other sources; if all your neighbours are avoiding a particular channel, there may be a reason for this.

✓ You can monitor exactly what's being sent and received over your crowded airwaves

The screenshot shows the NirSoft WifiInfoView application in 'Full Details Mode'. It displays a table of detected wireless networks with columns for SSID, MAC Address, PHY Type, RSSI, Signal Quality, Average Signal Quality, Frequency, and Channel. The 'Relish_Home_B237' network is selected. Below the table, there are sections for 'Element ID: 0 (SSID)' and 'Element ID: 1 (Supported Rates)'. On the right side, there is a 'Log' button and a 'Firmware Version' dropdown menu. At the bottom, there is a 'Set Password' button and a 'Router Update' button. The bottom status bar shows '41 item(s), 1 Selected'.

SSID	MAC Address	PHY Type	RSSI	Signal Quality	Average Signal Quality	Frequency	Channel
ELP WiFi	00-50-7F-AA-2D-40	802.11n	-85	30	30.0	2,437	6
M&G Wi-Fi Network	6C-7D-9F-DA-2D-6C	802.11n	-82	36	39.1	2,462	11
pcpro24g	C4-04-15-3B-E7-A4	802.11n	-33	100	100.0	2,437	6
Relish_Home_B08AC4	F8-35-DD-8D-0A-C2	802.11n	-80	40	40.0	2,427	4
Relish_Home_B07A61	F8-35-DD-8D-37-9F	802.11n	-88	18	21.6	2,427	4
SKYTE338	7C-4C-A5-D9-DF-D5	802.11n	-90	40	42.7	2,412	1
SKVA238F	4C-17-EB-4A-23-C0	802.11n	-95	4	24.2	2,412	1
TALKTALK-019F08	F8-E9-03-01-9F-08	802.11n	-89	16	21.0	2,457	10
tot123	08-8D-43-19-66-76	802.11n	-77	46	42.7	2,437	6
voironmedia1714218	00-9E-F2-C5-90-EA	802.11n	-88	18	16.0	2,462	11



◀ Superfast wireless routers can transform your connection speeds – as long as your clients are compatible

BAND ON THE RUN

If switching channels doesn't help, consider hopping to a different frequency band altogether. The 5GHz Wi-Fi band came into use in 2009 as part of the 802.11n standard, and since there's less interference in this band, it may provide better performance. (Strictly speaking, the 5GHz band had in fact been introduced a decade earlier in the old 802.11a standard, but this never really became popular.)

Some older devices may not support 5GHz, but this isn't necessarily a showstopper: most routers that support a 5GHz wireless network will let you run it alongside a regular 2.4GHz network. This does mean that you'll have two separate SSIDs to manage, which complicates the job of administering things, especially if you want to ensure your devices connect to the right one.

A second possible issue with 5GHz is that a higher frequency means lesser penetration, so you're less likely to experience interference from three doors down – but, by the same token, if you're trying to extend your network through an interior wall or two, you may find that the drop-off at 5GHz is barely preferable to the interference at 2.4GHz.

EXTENDING RANGE

Even if there's nothing but clear air between your router and its Wi-Fi clients, location can have a big effect on signal quality, since wireless links (like all radio transmissions) grow weaker over distance. If you want to improve the quality of a wireless signal far from your router – such as in a summerhouse at the bottom of your garden – a simple option is to invest in a wireless repeater or a range extender, which you can position between the two stations to retransmit packets back and forth at full strength.

It's worth noting that repeaters and extenders do different jobs. A repeater acts as a rebroadcasting station for

your router, and is effectively invisible to connecting clients. A range extender, on the other hand, operates a wireless network of its own, and acts as a bridge between devices connected to this network and your home LAN.

If you want to save money, it's possible to set up an old router as a repeater or range extender, although you may need to dive into technical settings to make it work, and older hardware may not support the latest high-speed connection technologies. It's also possible to configure a PC or Mac to act as an extender; of course, this isn't a particularly power-efficient solution, unless you're using the system for something else at the same time.

Whichever approach you choose, the involvement of more hardware and potentially more packets flying through the air means that network performance might not be as fast as it would be if you were able to move your PC closer to the router. But it should certainly be better than an unboosted long-range connection.

AIMING AND UPGRADING YOUR ANTENNAS

We've mentioned that walls affect signal strength, which in turn hinders your connection speed. In fact, almost everything in your home has an effect on the throughput of your wireless network: radio transmissions bounce off furniture and other obstructions, so even when you're in the same room as your router, there will be pockets of interference.

There's no way around this, but you can make a difference by moving your router, or adjusting the orientation of its antennas. One useful play

“If switching channels doesn't help connection speed, consider hopping to a different frequency band altogether”

is to position your router away from the floor, and as far from walls as is practical; otherwise, it will be surrounded by reflected signals. When it comes to finer positioning, you can use WifiInfoView, mentioned above, to test the strength of the signal in a given part of your home, and experiment with repositioning the router (or other items around your home) to see if any particular arrangement improves matters.

You can also try to upgrade your antenna to give it a better reach. You'll find various tutorials online showing how to build a reflector out of an old beer can, or out of tinfoil, which can help focus the signal towards your devices. If you don't mind spending a bit of money, you can replace your router's antennas altogether with a larger aerial on a cable. These are often advertised as “high gain”, but the benefit isn't really increased signal strength – rather it's the fact that it's easy to position such an antenna wherever you want, while keeping your router tucked away somewhere more convenient.

HACKING YOUR ROUTER

Another way to make the signal from your router carry further is to make it transmit more strongly. Typically, a domestic router will ship with a fixed transmission power of 70mW, and while you may be able to turn this down (to make it harder for people to piggyback on your network from afar), you can't normally turn it up.

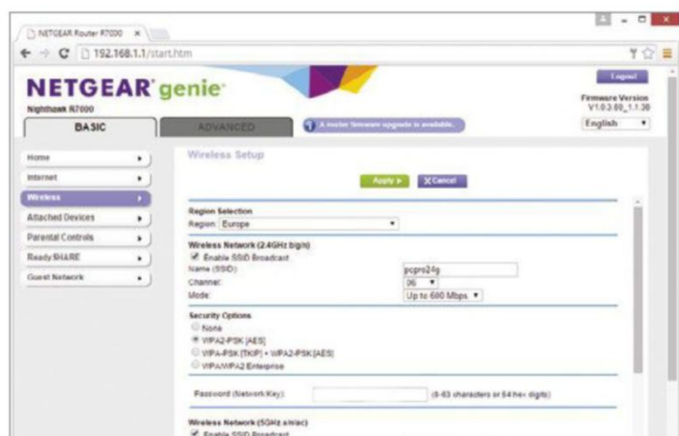
For the technically inclined, however, all things are possible. On a huge number of routers – especially older 802.11n models

– it's possible to replace the built-in firmware with the free, open-source DD-WRT. This provides access to a wide range of settings that aren't offered directly by the manufacturer, including the ability to ramp up the signal strength all the way to 250mW.

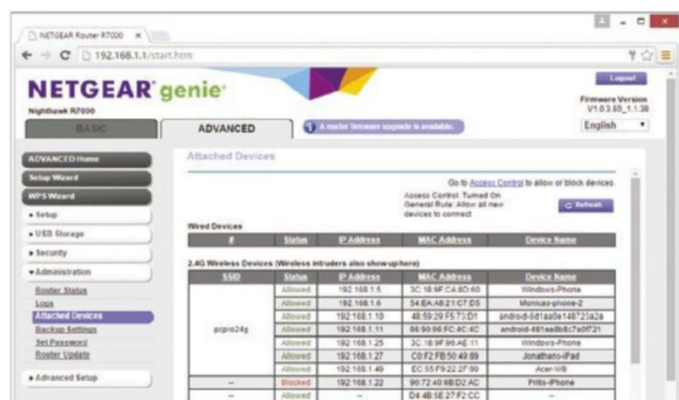
Of course, there's no such thing as a free lunch. Flashing third-party firmware onto a router



◀ A wireless repeater can rebroadcast the signal to help your network stretch further



Switching channel in your router is a simple way to dodge interference



Keep an eye on your connected clients – an intruder could be hogging your bandwidth

carries risks – and good luck getting the manufacturer to help you if anything goes wrong. Bear in mind, too, that you're tweaking only the strength of the signal from the router – your mobile devices will still be transmitting at their default signal strengths, so this won't necessarily do much for transfer speeds between them.

A final, rather important point is that turning up the signal strength to maximum may cause your router to overheat and crash. So if you want to try this hack, keep your router somewhere cool, and proceed with caution.

UPGRADE TO 802.11AC

The measures we've mentioned so far aim to squeeze the best possible performance out of your existing wireless network, but if you're not already using the latest 802.11ac technology, upgrading is likely to be the single most effective thing you can do to accelerate your network. Where 802.11n has a theoretical maximum connection speed of 600Mbps/sec, the latest 802.11ac routers push the limit up to 2.3Gbps/sec.

Of course, you shouldn't expect to see those speeds in real-world use. These figures assume perfectly matched hardware in perfect communication conditions, which you won't get even if you position your laptop directly on top of the router. All the same, you can expect

to see a significant boost simply from making the switch.

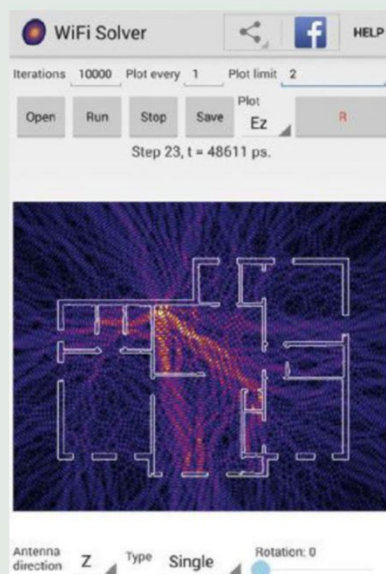
Buying a state-of-the-art router costs money – our current A-List favourite, the superfast Netgear R7500 Nighthawk X4, won't leave you much change from \$400. And only laptops and other devices that support the full speeds of 802.11ac will benefit. Most recent models will, but check before you invest.

IS WIRELESS THE ANSWER?

Our final recommendation may sound like a trick question: "What's the best way to improve your wireless performance? Don't use wireless." But if you want to hook up a PC to a router located at the opposite end of your home, there may be better options than Wi-Fi. The obvious alternative is powerline networking, which lets you run a wired Ethernet connection between two or more domestic power sockets, with no need to trail messy cables down the corridor.

It's not the perfect solution, however. Not all devices support wired Ethernet – smartphones and tablets certainly don't. What's more, mains circuits are inherently very noisy, and the signal degrades sharply over distance. Current homeplugs may advertise a maximum transfer speed of 300Mbps/sec over a Gigabit Ethernet connection, but if you're connecting across several rooms

VISUALISE YOUR WI-FI SIGNAL



If you'd like more insight into how the wireless signal strength varies in different areas of your home, 50p will buy you the WiFi Solver FDTD app for Android (tinyurl.com/p3sxxnr). This engaging little tool lets you upload a floor plan of your residence, then tap to position a virtual router in various places. An animated visualisation is generated showing how wireless signals radiate outward from the router, and how they bounce and fade on encountering obstacles and interference.

Although WiFi Solver FDTD is based on some serious physics, the animations it produces aren't perfect representations of reality: it can't account for the full 3D complexity of a room, and currently it will only map a 2.4GHz signal. All the same, it's a fascinating and revealing illustration of the complexities of wireless signal propagation.

then 60Mbps/sec is a more realistic expectation.

A compromise might be to invest in a powerline-based wireless extender. This lets you run a powerline connection from your router to another part of the house, and host a wireless network from there. The powerline run won't be as fast as a direct Ethernet connection, but if the location of your phone socket obliges your router to reside in a remote corner of the house, such an approach might be your best option.

Next month's Labs test focuses on hardware that can improve your wireless speeds and reliability, so look out for our top recommendations..



SIX KILLER APPS FOR BUSINESS

Supercharge your office: **Barry Collins** introduces six mobile apps that get the job done

Walk into any office, factory or boardroom, and you're likely to find more tablets and smartphones being used than PCs. Business is now often conducted on whichever device is closest to hand, and that means you need business-class apps.

Such tools can help with all sorts

of tasks, from team communication and note-taking to project management. Many powerful tools are cross-platform, and the ones we look at here have all been tested in live business environments. Here's our selection of six great apps for business, along with our advice on how to get the best out of them.



1 KEEP YOUR TEAM IN TOUCH WITH SLACK

Android, iOS, OS X, Windows, Windows Phone

When it comes to working as a team, email is a poor way to communicate. It's time-consuming, yet easy to overlook; important information is split across disparate threads; and when multiple revisions of documents are sent around as attachments, the scope for confusion is horrific.

Slack takes a different approach: it's a smartly designed instant-messaging app for grown-ups, which we use here at *PC & Tech Authority* to escape the pitfalls of email. Individual projects or groups can be divided into separate channels (each denoted with a Twitter-like hashtag) – so you might have one channel for the #Marketing team, for instance, and another for the #WinterMarketingCampaign. You can divide and subdivide team members as necessary, so that everyone relevant is kept in the loop, while those who needn't be involved in a conversation aren't disturbed.

All the conversation in each channel

flows as a single thread; there are no separate threads for different topics. For people used to creating different conversations with unique subject lines in email, this can be discombobulating at first, but you soon get used to having everything in one place. There's a slick search facility, which is very fast, highlights the search terms in results, and generally makes it a breeze to jump back and pick up an older conversation thread whenever you like. You can also share documents with other channel members, and comments made about those documents are retained alongside the documents themselves, so there's no need to dredge through your inbox to collect together all the responses to a particular draft.

Slack works on every major platform, and you can pick up and join conversations on whichever device you have to hand. It's free to use, but if you want a searchable archive past 10,000 messages, you'll need to upgrade to one of the paid-for plans, which start from US\$7 per user, per month. It's a smart business model, because after a few weeks of using Slack, we don't want to go back to the 562 unread messages in their inbox.

2 ORGANISE YOUR NOTES WITH THE EVERNOTE APP FAMILY

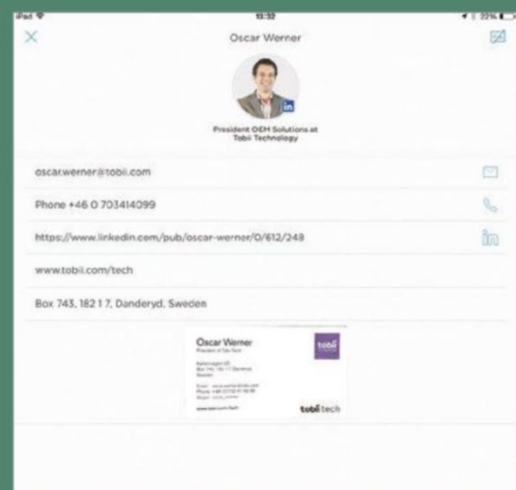
Android, iOS, OS X, Windows, Windows Phone

Evernote was the note-taking app of choice for professionals before the iPad was a gleam in Steve Jobs' eye. Today, it's grown into a family of tools that integrate seamlessly under the main Evernote app.

Let's start with Penultimate, a digital handwriting app for the iPad. Partnered with a Jot Script Evernote Edition stylus (around \$70), it's the first app to persuade us that writing cursive onto a tablet screen might just work. This is largely thanks to the Zoom box, which hones in on a small part of the screen and moves the page beneath you as you write, allowing you to write in the way you would with a real pen and paper. Even with our sloppy journalists' handwriting, the search facility does a remarkably good job of transcribing, and your Penultimate scrawlings are saved back to Evernote without fuss.

Then there's the Scannable app for iOS, which lets you capture printed or handwritten documents, such as expenses receipts or Post-it notes, and save them to your Evernote folders (or as Calendar appointments if the document details a date). Scan a business card – either using Scannable or the mobile Evernote apps – and not only is the information instantly digitised for storing in your contacts, you're also prompted to make an instant connection on LinkedIn, which is an effortless way of building business relationships.

Finally, the cross-platform Skitch app has one killer feature: it lets you quickly annotate Google Maps. So if you need to give a client or colleague clear instructions on how to get to a meeting venue, or want to mark up a "Find Us Here" map to be embedded on the company website, it's perfect for the job.

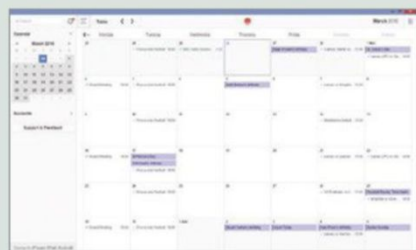


3 STAY ON TOP OF YOUR CALENDARS WITH SUNRISE

Android, Chrome OS, iOS, OS X, Windows

Sunrise is a powerful calendar manager that works on every major platform other than Windows Phone – which is probably why Microsoft recently paid US\$100 million to acquire its publisher. Hopefully, this doesn't mean development on other platforms will be scaled back, because in the overcrowded field of calendar apps, Sunrise is the best.

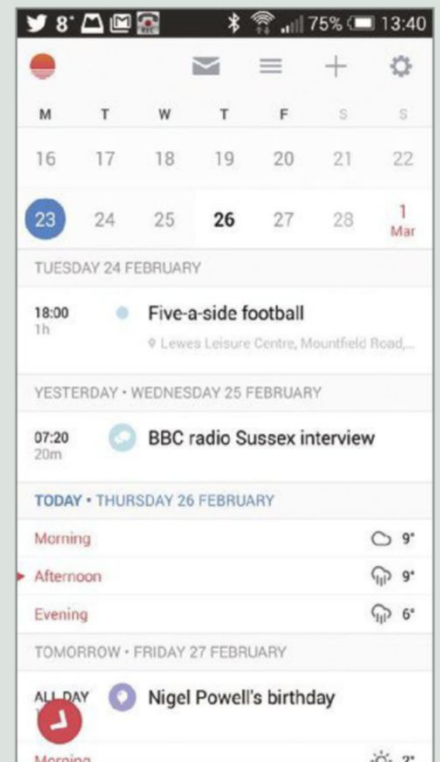
That's partly because it brings together such a wide array of professional and personal calendar systems: Exchange, Google and iCloud events are covered, as are reminders from other apps including Evernote, GitHub and LinkedIn. Sunrise folds everything together into a single schedule view that shows you what's on



the agenda for the next few days, along with a weather forecast.

The execution is full of delightful touches, such as the way calendar events are automatically assigned icons based on their descriptions. Appointments containing the word "interview", for example, get little speech bubbles, while "birthday" gets a balloon. Create a new appointment and (on Android and iOS) you can dial in the time on a virtual clock face – a faster and more intuitive interface than conventional dropdown menus.

Android users can also install a Sunrise widget on their homescreen, for an at-a-glance rundown of upcoming appointments and the option to quickly add them without first having to open the app. Desktop users, meanwhile, can use Sunrise via a Google Chrome app, which lets you run the calendar in a standalone window. Here, you have to double-click on a blank space in the relevant day to create a new appointment, which isn't immediately obvious – but this is possibly the only usability faux pas that Sunrise makes on any platform.



4 COGI: CAPTURE AUDIO RECORDINGS THAT CUT TO THE CHASE

Android, iOS

Even shorthand experts will admit that notes taken in meetings are never a true representation of what was said. Cogi lets you capture those key moments of meetings, speeches or presentations without having to wade through a recording of the full session.

Using Cogi is as simple as activating it at the start of the meeting; this sets Cogi listening to what's being said, but recording starts only when you hit the Highlight button. The clever part is that – since you often don't know in advance when someone's about to say something that's worthy of note – Cogi maintains an audio buffer. So when you tap Highlight, the audio capture begins with the preceding 15 seconds of audio. (If you prefer, you can set the pre-capture buffer to 5, 15, 30 or 45 seconds.)

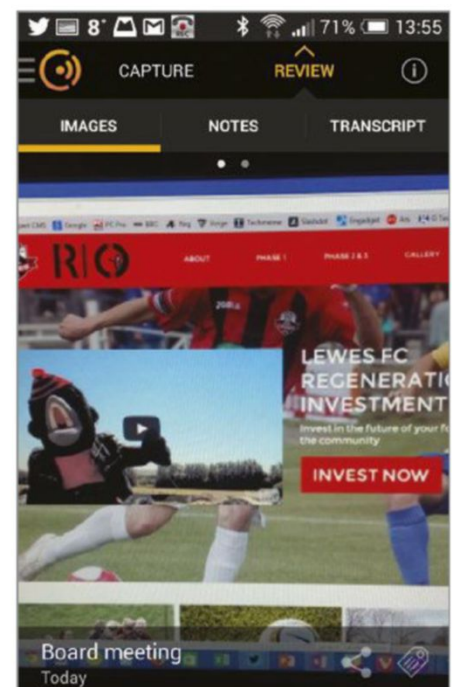
When the interesting bit is over, simply tap again to stop recording. There's no limit on the duration of highlights – it can be a five-second sound bite or a 30-minute monologue. The idea is to record only the crucial bits so you can quickly review the highlights at a later date.

All of the highlights from one meeting are



grouped together in a single session, and each clip can be named for later reference. It's also possible to add text notes and photos to a session. Sessions can also be tagged – the app allows you to search your contacts for the names of speakers to tag, as well as providing default tags such as #FollowUp, #Important or #Reminder. Tags and notes can be searched to make it easier to locate old recordings at a later date.

The app is free, although there's a



subscription service allowing you to pay for a transcription of your notes. Since the whole point of the app is to record only the highlights of a meeting or a presentation, however, it shouldn't be too painful to do the transcribing yourself.



5 KEEP A CONCISE RECORD OF YOUR MEETINGS WITH MINUTES

iPad

Similar to Cogi, Minutes is designed to ensure that those key meeting moments aren't forgotten once you leave the boardroom. It makes the process of taking minutes as painless as possible – as long as you can bear tapping them into an iPad – handling everything from recording action points to sending the finished minutes to attendees.

You start by entering the description of your meeting – or if the meeting is already stored in your Calendar, Minutes can extract the title from there. You then add attendees from your iPad's Contacts. If you don't have email details stored for a particular attendee, their name will be highlighted in orange, and you can tap on them to add an address.

The Minutes form also includes a “preparation space”, where you can type any notes that will remain private to

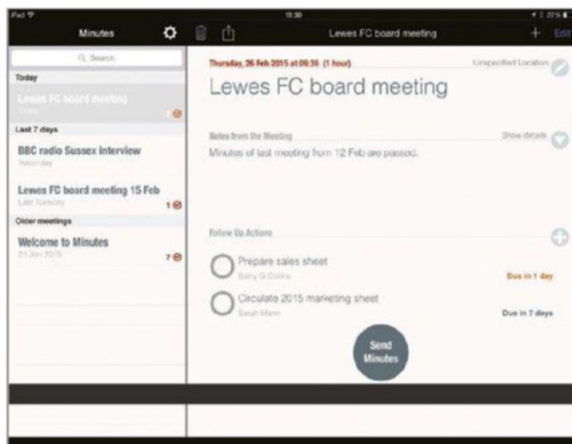
you (perhaps arrangements for forthcoming meetings). Then there's a form where you note down the minutes as you normally would. The layout is clear, although we'd like to see more formatting options, such as the ability to underline or embolden headings, or to use bullet points and numbered lists.

More usefully, alongside general notes, it's also possible to create action points. The form lets you enter an action point, assign a person responsible from the list of attendees and set a deadline.

When the meeting is complete, and all the notes and action points have been taken, you can press a single button to send the minutes to all the attendees, with the action points and deadlines included. Then, at the next meeting, you can call up the minutes from the previous meeting (rotate the iPad into landscape mode to access notes from previous meetings) and tick off each action point, making it easy to ensure that everything has been done.

You can also create threaded recurrent meeting records, good for regular committee get togethers.

Minutes keeps things clear, concise and accountable.



6 ECLIPSE MANAGER: PROJECT MANAGEMENT

Windows 8

If you work on several projects at once, and use Windows 8, take a look at Eclipse Manager. It helps you keep track of all the individual tasks that need to be completed for each project, identifying which require your immediate attention and which can be kicked into the long grass.

The Eclipse Manager UI is broken down into Folders, Projects and Tasks. Folders organise projects of a similar type (say “app development”), while Projects (such as “contact management app”) comprise a list of Tasks (“wireframe the homepage”) that need to be completed. Each project can be cost-tracked, with three charging options: incremental (with sums assigned to each task), on completion or hourly. If you're charging by the hour, you can use the app to track when you're starting and stopping work on a particular task, helping you keep on top of the billing.

Individual tasks, meanwhile, can be assigned a priority and specific deadlines, and sorted into different columns within projects. You might create columns for “to do” and “completed tasks”, or create subcategories of tasks within a project. Simply right-click in an empty space in a Project to bring up the option to create columns.

Eclipse isn't the most sophisticated task manager out there. There's no option to create charts or dependencies – you can't specify that tasks A and B must be done before task C can be started – and you can't set an overall deadline for your project.

Yet that very simplicity is what makes Eclipse so appealing: you can pick up the software and get started in seconds. Just log your Projects and Tasks, review what needs doing first in the Time Line view, and get on with the stuff that earns the money. The Live Tile will remind you of your to-do list if you become distracted.

HOW TO KEEP YOUR BUSINESS DATA SAFE

In most small businesses, employees using mobile apps for work will be doing so on their own devices. This raises the issue of how you protect sensitive company data. Android, iOS and Windows all provide a means for managing business data on employees' devices, but management software is needed.

For devices running version 5 of Android (Lollipop), Google recently introduced work profiles. It creates a dedicated profile for business-related apps, email and browsing, which is encrypted and can be remotely wiped by the IT department, leaving the employee's personal data intact.

Google has also released an Android for Work app for phones and tablets running earlier versions of the OS. This isolates business mail, calendar, contacts and

approved apps into a separate folder on the device's homescreen, with a briefcase icon overlaid on apps that are managed by the company's IT department. A variety of enterprise mobility management (EMM) providers support Android Work profiles, including Citrix, MobileIron and Google itself.

Apple, too, allows companies to wipe sensitive business data from iPhones and iPads, leaving personal data and apps untouched. Companies can also set up internal app portals from which employees can download and install business-approved apps onto their devices, or publish their own in-house apps that are available only to company employees, without having to go through the public App Store submission process. IT departments can also enforce security policies on BYOD

equipment, optionally requiring employees to set a complex passcode of up to 37 characters, instead of the standard four-digit code, or automatically wiping the device after a set number of unsuccessful passcode attempts.

When it comes to Windows, System Center 2012 R2 provides many of the same BYOD management facilities. One particularly useful feature for IT admins is the ability to require employees to use a VPN connection when they open selected Modern apps or traditional desktop applications. This ensures business data can't be intercepted when employees are using their own tablets on public Wi-Fi hotspots, eliminating the risk of eavesdropping hackers grabbing sensitive data or credentials.



ALASTAIR JARDINE

SENIOR UX ARCHITECT

We look at jobs in IT and talk to someone in the field

WHAT DOES A UX ARCHITECT DO?

I work with a team of software developers at The Guardian to create software that users enjoy using. That might mean the website, mobile apps, internal tools – you name it. Currently, I'm working on the internal content-creation and -management tools that we use to publish articles onto the website quickly.

WHAT DOES YOUR TYPICAL DAY LOOK LIKE?

A big part of the job is trying to understand what people need – so I spend a lot of time talking to users: this could range from one-to-one chats to formal sessions in a dedicated studio. A few years ago, UX was treated as something a bit separate – we were almost expected to take the project specification away and come back with a finished product. We work more closely with the developers and users now, and that's great, because it means you can come to understand the product and the constraints the users are under. And you know when you can challenge the accepted wisdom too: where you can turn around and say, actually, I think we can do this differently.

Overall, the days are quite structured – you certainly wouldn't find yourself working from 8am till 8pm every day, and weekend work is rare. It's mostly office-based, but sometimes we do a contextual enquiry, where you observe how software or a website is used in context, rather than in a lab. For example, you might be working on a mobile app that will be used by someone walking down the street, so you really need to see it being used in that context.

HOW DID YOU GET INTO UX?

Following completion of my Master's degree in geographic information systems, I worked at Network Rail. There I had the opportunity to be part of a project looking at the experience of a mapping product, and I quickly found I had an affinity for UX. Luckily, my employer supported a transition into a full-time UX role, and I've never regretted switching. It's not uncommon: I know UX specialists who have moved across from lots of different backgrounds.

WHAT SPECIFICALLY DREW YOU TO THE ROLE?

There's a sense of satisfaction when you feel you understand what people want, and you're able to build something that meets those needs. UX design is creative; we do a lot of sketching and ideation, and trying to think of different ways to solve problems – because, of course, the best answer is never the first one you come up with.

It's nice to work with people, too, although it can be frustrating at times; in a big project, there are always going to be those who don't like the new things you're suggesting. It can be disheartening when you've worked hard to make something good, and all you get back is criticism. Then again, it's our job to listen to that criticism: within it, there may well be something that we can take away and learn from, and as a result make the experience even better.

WHAT TECHNICAL SKILLS DOES A UX ARCHITECT NEED?

I spend much of my time talking to people and drawing sketches, but I also get involved in building prototype interfaces, using HTML and JavaScript. I think a good UX person should know enough about the framework they're working within to be able to do that. It's all very well drawing something in Illustrator or OmniGraffle, but some knowledge of coding enables us to try out interface concepts, before the development team gets stuck in.

HOW MIGHT SOMEONE START A CAREER IN UX?

There are a lot of openings in UX, but also a lot of competition – so the more experience you can gain the better. I'd suggest looking at places such as General Assembly (generalassemb.ly) – I know they run a good ten-week course in UX, both full-time and part-time.

There are also Master's programmes in human computer interaction. You don't necessarily need a qualification specifically in UX – there are many different disciplines within the field, so it's a fairly open and accepting business. It's also the sort of job

where nobody knows everything: I still spend time reading up on new ideas and thinking about how I might apply them to my projects.

The other key thing you need is an ability to understand users; if you can't empathise then UX may not be a suitable role for you!

WHAT'S THE PAY LIKE FOR A UX ARCHITECT?

There are a lot of UX contracts out there offering good money – some sectors, such as banking, are very well paid indeed. Online gambling is well compensated too. UX jobs are quite “banded”, though: you might start as a junior UX consultant, and move up through mid-weight and senior positions before you take on a lead role. Still, that means there's quite a good structure for progression. ●

WHERE TO START

- Don't Make Me Think! by Steve Krug
- The Design of Everyday Things by Don Norman
- Undercover User Experience Design by Cennydd Bowles and James Box





BLOCKCHAIN: HOW THIS BITCOIN TECHNOLOGY COULD CHANGE THE WORLD



Nicole Kobie reveals how a key piece of Bitcoin tech could change how we sign contracts, pay for taxis and even elect governments

Bitcoin has seen an astonishing number of highs and lows in its brief life – a single bitcoin is worth about \$306 at the time of writing, down from more than \$1300 in November 2014 – while a number of legal and security challenges mean it hasn't yet broken into the mainstream for payments. But there's one part of the Bitcoin story that could have more wide-reaching effects in our world than the financial side: the blockchain.

"What's interesting about Bitcoin isn't the currency itself, but rather the underlying technology, the blockchain," explained Primavera De Filippi, research fellow at the Berkman Center for Internet & Society at Harvard Law School, speaking at Nesta's FutureFest. "It's the decentralised public ledger that relies on cryptography in order to ensure that every transaction is valid."

The way it works makes the blockchain an ideal way to ensure transparency and integrity when the two parties involved in any business don't trust each other – one person can send another a bitcoin without knowing a thing about the other, and the system ensures the transaction takes place as promised. And since it's decentralised, no individual controls it; it acts as a virtual, trusted middleman.

Such features make it an intriguing alternative to everything from banks to Silicon Valley tech giants, advocates argue, with De Filippi comparing the decentralised freedom it offers to similar hopes for the internet in its early days. The blockchain principle could become the engine behind new financial systems, smart contracts and even democracy itself. However, the complicated nature of the system means there's a lot of work that has to happen before this all

becomes a reality.

BLOCKCHAIN EXPLAINED

Basically, the Bitcoin blockchain tracks who sent how many bitcoins where. If Bob sends bitcoin #123456 to Susan, it's marked in the blockchain.

That record isn't held in any single place, but copied to every Bitcoin user, each of whom holds the entire transaction record for themselves. You can add to the ledger, but you can't remove anything – there are far too many copies with which to meddle. Transactions are validated by proof of work (that is, the mining at the heart of Bitcoin), with the coins dished out to reward people for validating transactions.

Blockchain fans see it as a way to ditch the middleman, to get rid of the Silicon Valley firms that hold a single copy of our online "transactions" and take control of it for ourselves. Bob could send a message to Susan, or a sum of money, or anything else, and the record would verify it, without the need for a third party, such as a bank or email provider.

SMART CONTRACTS

This is the idea behind smart contracts, which act like a computer program: if this, then that. If the first person pays the fee, then the second person gets the product.

De Filippi describes such activity as "automated transactions between humans and machines, or between multiple machines, which are automatically executed and automatically enforced by the underlying code of the technology".

One such transaction is betting: everyone places their bets in a secure, neutral account, and the program does out the winnings once the results are in. It's been suggested that everything from mortgages to online shopping could be managed via smart contracts, with the blockchain ledger executing the hand-off



▲ De Filippi believes the blockchain ensures transparency in transactions

of money and goods in a neutral manner. Car rentals or leases could be managed in the same way: while you're making your payments, your digital ignition key will continue to work; if you don't, it will be disabled.

Such smart contracts could benefit the sharing economy. At the moment, this is held back by the fact that we don't trust each other, so have to run our transactions and negotiations through a trusted third party – more often than not a major American firm.

De Filippi said that a blockchain "can be used for performing automated transactions in a trustless environment, in a language that is both computable and unambiguous," and that could include anything from basic legal contracts and notarisations to financial trades.

BLOCKCHAIN PROGRAMMING

It's capable of going much further, however. "When we combine multiple smart contracts together, we can create decentralised autonomous organisations, which can be considered autonomous agents, both in that they're independent and also that once they've been deployed on the blockchain, they don't need the creator and no longer need to listen to them," she said. "They're self-sufficient, in that they can charge users for the service they provide in order to pay for the processing they need."

Such programs can be used to provide distributed and secure data storage, and even to build distributed applications,



BLOCKCHAIN

BLOCKCHAIN IN THE REAL WORLD



LIGHTHOUSE

(vinumeris.com/lighthouse/faq) is essentially a bitcoin wallet with a built-in contract: you pledge coins to a project, just as you would on Kickstarter. If enough people put forward funds, the project goes ahead, and the funds are handed over.



ETHEREUM

(ethereum.org) was started by 21-year-old Vitalik Buterin. It's a decentralised app-publishing platform that uses units called Ether to pay for contracts to keep services running, including voting, registries and contracts.



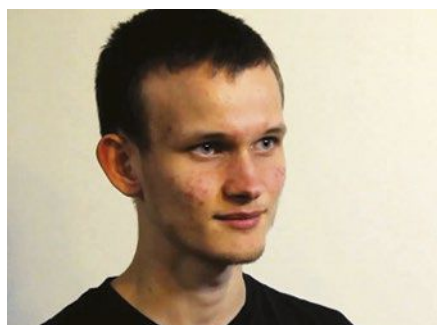
RIPPLE LABS

(ripple.com) doesn't use a blockchain, but does employ a similar ledger system to make applications for financial trades and payments. The idea allows individuals and businesses to move money securely and instantly around the world.

such as file-sharing or social networks. They could also create "government systems that are generally more flat, more transparent and allow for potentially more democratic and participatory decision-making," she added.

An electoral blockchain could let votes be registered in a simple, secure and transparent way, with a contract on the other side for the end result to be delivered.

It could even change how apps and services are run, noted Vitalik Buterin,



▲ Vitalik Buterin pointed to hurdles that need to be overcome before blockchain technology can take off

"Blockchain fans see it as a way to ditch the Silicon Valley firms that hold copies of our online transactions"

founder of blockchain platform Ethereum. Imagine an app that's built but gets shut down after it's bought by a larger company, leaving its users cut adrift. If the program had been designed in a decentralised way, it couldn't be shut down. "A blockchain is this magically decentralised computer that's going to keep running your program faithfully for as long as it exists. You have no ability to change it," said Buterin.

BLOCKCHAIN: THE DOWNSIDES

Although he runs a firm based on the idea, Buterin admits that "the journey of decentralised tech is complicated". As appealing as it is to "get rid of the evil middlemen," Buterin noted that there's value in the firms that stand between us

and our transactions, pointing out that payment systems let us reverse charges in the case of scammers, for example.

There are other potential downsides to relying on blockchains too. At the heart of our human interactions are ideas such as equity, mercy and compassion, De Filippi noted, and we can't code for such ideas.

That makes it difficult to delegate decision-making to a machine. Plus, if a piece of code takes off and we can't stop it, what happens if it starts damaging other systems, or even us?

DON'T PANIC

We need to make sure our tools don't start manipulating the world around us, making us their tools, she warned.

"What can we do?" asked De Filippi. "First of all, don't panic. The future is right here, right now, and we just have to take a look at it. Technology can be used for both good and evil. We have the possibility to shape the future... I think it's important that we continue to be aware of the potential drawbacks it could bring to society, so that we can all watch better to avoid this from happening." ●

COMING UP: ALUMINIUM-ION BATTERIES

How would you like a battery that charges in only one minute?

One of the burdens of modern times is running out of power on your smartphone, tablet or laptop, and then being tethered to a charging socket while you top up the battery.

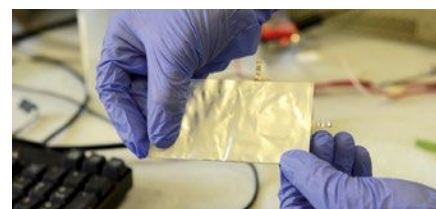
This could be set to change thanks to researchers at Stanford University, who have created what they say is the first high-performance aluminium-ion battery – which can recharge in only one minute.

Aluminium has long been considered a possible alternative to alkaline or lithium-ion batteries, the latter of which are found in devices such as smartphones and laptops. However, previous attempts

to use the material resulted in units that died after 100 recharge cycles.

Stanford researchers have now stumbled upon a solution: graphene. If the futuristic wonder material is used as one of the electrodes, that issue can be overcome. Now, the aluminium battery lasts for 7,500 cycles – even more than standard lithium-ion units, which survive about 1,000 cycles.

There are other potential benefits too. Aluminium is safer than lithium, which can be dangerously flammable. The researchers said you could drill through their battery without sparking



▲ Aluminium is safe and malleable, making it a better basis for smartphone batteries

any flames, and it's malleable enough to be made into different shapes – handy for smaller devices. However, the battery offers only half the voltage of lithium-ion counterparts. The researchers said this could be improved, but stressed that development of aluminium-ion batteries is still in its early days. We'll have to wait a bit longer for one-minute recharges.



SNOWDEN ON THE FUTURE OF SPYING AND SURVEILLANCE

Infamous NSA whistleblower Edward Snowden is optimistic that we can fight back against mass surveillance, but has a warning about the rhetoric used: they're not public safety programmes, he points out, they're spying programmes

Two years ago, former National Security Agency employee Edward Snowden leaked documents revealing the full extent of communication surveillance by the US spying agency. He now lives in Russia, to avoid US charges, but has popped up at various conferences via Google Hangout, including Nesta's FutureFest held in London in March.

This is an edited transcript of some of Snowden's responses to questions asked at the London event. You can watch the full interview at tinyurl.com/ndgmeyl.

Many of the things you've said are in some ways relatively timeless principles about the rule of law, the trade-offs of security and freedom and surveillance. But how different will these questions look in a few years' time, with perhaps easier access to strong cryptography, with the internet of things meaning we'll all be followed everywhere we go? So there's this fork in the road today; this is one of the few places I think in the global political debate where we have a meaningful choice to make about where we steer this. If we go along with the status quo, we're going to have a mass-surveilled [sic] world. And what I mean by that is we're not just worried about the UK government, we're worried about every government in the world doing this.

Additionally, companies being able to do this... criminals being able to do this, having access to the entirety of the human pool of communications that's washing back and forth across the internet every day.

But we also have the ability to enforce, both through statute and through systems, a different path, where we decentralise permissions over the use of our communications. We decentralise the ability to decide the level of publicity that's attached to any of our communications. We can still publicly post a message to Facebook that's globally readable, but we could also adjust things so that they can be shared only with those closest to us and be confident that this is enforced through both legal and a systemic standards-

based protection.

Ultimately, it's an open question: and this is very much an area where things could happen unpredictably. I think it's likely that the technical side of the argument will win because it's easier to protect communications while they're in transit than it is to enforce legislation in every country in the world.

Are you moderately optimistic about how we're going to deal with this massive surveillance or do we need another disaster before we change course?

I am optimistic [but] I think we're going to see disasters on both sides. I think we're going to see them exploited callously and relentlessly by governments for purposes that undermine the progress

▼ Panelists (left to right) Vivienne Westwood, Breffni O'Connor and Luciano Floridi at FutureFest

of the public's interest to the expense of elite interest. When we look at the full-on mass surveillance of everyone in the country in the United States, it doesn't work... it isn't going to stop future attacks either. Because again, they're not public safety programmes; they're spying programmes.

How are you coping with your situation currently, and what are your feelings about your own future?

Weirdly, I don't think about it much any more. Before any of this happened, I had a more forward-looking perspective. You think about retirement, and you think about vacations; you think of where you're going next. One of the unexpectedly liberating things of becoming this global fugitive is the fact that you don't worry so much about tomorrow. You think about today. And I like that very much. ●



WHAT IS... AMAZON DASH?

Order key products with internet-connected buttons that let you push once for delivery. Is the Dash Button the future of the smart home or another Amazon folly?

Tired of traipsing down the aisles of your local supermarket? Amazon hopes so – it's offering small buttons that you can stick up around your home to reorder key products. Here's how it works.

WHAT IS DASH?

Amazon Dash is a set of standalone buttons that connect to your Wi-Fi and Amazon Prime account. Stick them up around your home – the kitchen, utility room and bathroom – and simply press them to reorder products. If you're a fan of Gillette razors, for example, you could affix the Gillette-branded Dash button to your bathroom mirror, and press it when you're out of blades. A new pack lands on your doorstep in two days, with free delivery via your Prime subscription.

Does that mean we can reorder beer at the touch of a button?

Not yet. The Dash buttons work with only specific branded items.

So you'll need a Tide button if you want to reorder the laundry detergent directly from your washing machine, or a Bounty button if you simply can't bear to head to the shops for paper towels. Other products on the list include bottled water, macaroni cheese, nappies and Gatorade, because no-one can get by without some electrolyte-charged sugar water.

SO YOU'LL NEED A BUTTON FOR EVERY ITEM?

Yes, and it means you'll always have to order the same brand – there's no switching to a different brand of bin bags if Glad is deemed too expensive. Currently, there are only three buttons available per home for initial preview, but Amazon is offering a way for



manufacturers to build the tech into their appliances, so your coffee machine might have a built-in Dash button for when you run out of beans.

IF YOU HAVE TO WAIT TWO DAYS TO GET THE BEANS, ISN'T IT EASIER TO GO TO THE SHOP?

Indeed. While it may make sense for some products, you'll still have to shop for most products. Plus, Dash triggers an individual delivery for each item, meaning your toilet paper racks up some extra emissions alongside additional packaging.

AND WHAT HAPPENS WHEN MY CHILD AMUSINGLY PRESSES THE BUTTON 18 TIMES?

Amazon has considered this: if you've already reordered the product, more can't be ordered until the first batch has actually been delivered, and you can cancel the order online.

THE NAME SOUNDS FAMILIAR... IT ISN'T THE FIRST SHOPPING PRODUCT AMAZON HAS RELEASED CALLED DASH.

Last year, the firm unveiled a barcode reader wand that enables you to scan products in your own home to add to your shopping list for reorder from the retailer. That's still available for US shoppers in limited areas.

HOW DO WE GET IT?

So far the service is available only to Amazon Prime customers in the US. Visit tinyurl.com/onb9pga for more details.



CROWDFUND THIS! SBWLY CHARGING CABLE

Our pick of tech projects on Kickstarter and Indiegogo

A USB cable? Who doesn't have a drawer full of those already? That's true, but SBWLY is no ordinary cable. To begin with, it's flat so, unlike the spaghetti of cables tangled uselessly in your drawer, the SBWLY wraps up in a neat coil around the USB connector using a system of interconnecting fasteners.

It's a tidy cable – so what?

SBWLY's developers say it offers the "practicality of a travel cable with the efficiency of a standard-length charging and data-sync cable". It's designed to be slim and tuck away easily, so you can keep it in a bag or pocket without having to untangle it when you need to use it. And despite the fact the package is only 7.2mm high and smaller in area than a credit card, it still reaches power outlets that are 83cm away.

Any other benefits?

The developers claim it's more durable than rivals, in part because the cable bends along the natural curve of the wires – who knew a wire had natural curves? And if you're really bored, you can use the cable's fasteners to make different loops or shapes "just for fun", they say. We hope it never comes to that.

And if one were to attempt to say SBWLY out loud, what should it sound like?

Spooly. Get it? No, we didn't until watching the promo video.

How much is this life-changing cable going to cost?

Early-bird supporters can get the cable for around AUD\$24, a discount on the final price of AUD\$30. It comes with a travel case and is available in both a micro-USB and Lightning versions, to support newer Apple devices. You can choose from a wide range of colours, including white, pink, lime and orange. The SBWLY will ship in July, and at the time of writing had more than 450 backers raising almost \$20,000 of the \$60,000 goal.



DVD CONTENTS

Apps, essentials, full software, drivers & more!

FEATURES

+ASHAMPOO MUSIC STUDIO 5
+BACKUP4ALL 5 LITE +MYKEYFINDER
2015 +XPLORER 15.0

DRIVERS

+ ATI CATALYST + NVIDIA FORCEWARE

HELP

+ DISCLAIMER + DAMAGED OR FAULTY
DVDs + USING THIS DVD + INSTALLING
SOFTWARE

EDITORIAL

+ BURNING AN ISO IMAGE + PC&TA
EDITORIALS

TROUBLESHOOTING

+ SERIAL CODES + BLANK
REGISTRATION WEBSITE + CAN'T FIND
A FILE? + INSTALLATION ERROR

WINDOWS

CCLEANER + CLASSIC SHELL +
CUTEPDF + DEFRAGGLER + FOXIT
READER + GREENSHOT + APPLE
ITUNES + LIBRE OFFICE + OPEN OFFICE
+ MALWAREBYTES' A/M + SANDBOXIE
+ VLC MEDIA PLAYER + FLUX + 7ZIP

MAC

+ ALFRED + BETTERTOOLSTOOLS +
APPLE ITUNES + DROPBOX + FLUX +
GOOGLE CHROME + MOZILLA FIREFOX
+ PLEX + SKYPE + TEAMVIEWER + VLC

INTERNET

+ VUZE + DROPBOX + GOOGLE
CHROME + MOZILLA FIREFOX +
MOZILLA THUNDERBIRD + SKYPE +
STEAM

LINUX

+ TINY CORE LINUX

INSTRUCTIONS: Open Windows Explorer,
navigate to your DVD drive and double-
click Index.html in the root directory. **DISC
PROBLEMS:** To replace faulty DVDs, please
send the discs to: PC&Tech Authority DVD
Replacements, Level 5, Building A, 207 Pacific
Highway, St Leonards NSW 2065

Make sure to include your name and postal address on the back of
the package so that we know where to send the replacements. For
all other DVD related issues email cd@pcauthority.com.au. As the
delivery platform only, PC&TA and Haymarket Media cannot and will
not provide support for any of the software or data contained on these
discs. Although all discs are virus scanned, Haymarket Media cannot
accept any responsibility for any loss, damage or disruption to your data
or computer system that may occur while using the discs, the programs
or the data on them. There are no explicit or implied warranties for any
of the software products on the discs. Use of these discs is strictly at
your own risk.

FULL VERSION



ASHAMPOO MUSIC STUDIO 5

Ashampoo Music Studio 5 is a capable
collection of tools which makes it easy
to build, manage and share your music
collection.

There are modules to rip your CDs,
or burn audio files to disc. You can edit
your files, check or edit audio tags, or
convert music between various formats
(MP3, OGG, WAV, FLAC, WMA, Opus). An
Organizer renames or moves files based
on their tags, a "Video to Music" function
extracts and cuts video soundtracks, and
there's an audio recorder, a normalisation
tool, a cover art and inlay designer, and
much more.

These functions are often more
complete than you'd expect. The CD ripper
doesn't just grab all the files from a disc
and dump them in a folder, for instance.
You can now choose exactly which tracks
to import, selectively edit key tags, define
quality settings (sample rate, bitrate,
channels), and pick your preferred file
naming scheme (artist-title, track artist-
title, track artist-title year, or some other
custom arrangement of your own).

Ashampoo Music Studio doesn't
take much effort to use, either. A
straightforward interface organises its
features into eight categories, and several
of the modules deliver maximum power
for the very minimum of effort. Point
the "Analyze Files" option at your Music
folder, say, and it'll scan for incorrect file
extensions, missing tags and more, before
fixing them all with a single click.
www.ashampoo.com/

REGISTRATION & INSTALLATION:

- Download and run [ashampoo_music_studio_5_19246.exe](#)
- After you launch the software, a prompt
will be appear requesting you to register.
- Click on "Get free activation key", this will
open up a link in your default internet
browser.

- Enter your email and hit the "Request full
version key".

REQUIREMENTS:

- Windows XP, Vista, Windows 7, or
Windows 8
- 200MB hard drive space

LIMITATIONS:

- Registration Required.

NOTE: Users who have previously
registered an Ashampoo product, please
log in.

Once you have logged in, go back to
within the application and click "Request
FREE full version key" again and fill out the
prompts accordingly.

Copy and paste your license key into the
application, press next and complete the
installation process.

Congratulations! You have unlocked
Ashampoo Music Studio 5

For support of this software, please
direct your queries to: <https://www.ashampoo.com/en/aud/sup>

BACKUP4ALL 5 LITE

Backup4all is an easy-to-use but very
capable backup tool, available in three
different versions. The Lite edition is aimed
at home users, but still offers all the core
functionality most people will need. You
can specify the files and folders you'd
like to back up; these can be saved to
local, external or network drives; there
are options to compress your archives,
or password-protect them for security;
and a simple scheduler can automatically
run your backup jobs every day, week or
month.

Restoration is just as straightforward,
because your backups are just mirrors
of the original files and folders, stored in
regular zip files. Simply open an Explorer
folder and you'll be able to find and
recover what you need in seconds.

www.backup4all.com

FULL VERSION



REGISTRATION & INSTALLATION:

- Download and install b4asetup.exe
- Follow the installation process. Once completed, a website will appear asking for you to register for a license key. If your browser does not launch, manually point your browser to www.backup4all.com/free/creativemark14.html
- Once you have entered in your details, you should receive your license key immediately.

REQUIREMENTS:

- Windows XP, Vista, 7 or 8
- 50MB hard drive space

LIMITATIONS:

- Registration Required

NOTE: During our testing, we were not prompted to enter a license key.

For support of this software, please direct your queries to: www.backup4all.com/kb

MYKEYFINDER 2015

Reinstalling Windows and your software can be a tedious experience, and we're not just talking about having to snooze through a succession of glacial progress bars. The real pain comes in having to track down all your product keys, locating the CDs, the emails, or whatever bit of paper they arrived on originally.

MyKeyFinder 2015 can speed up the process by assembling all your keys in one place. Just run it on a PC, wait as it scans your installed applications, then print its list of licences, save them as a PDF file or copy them to the clipboard for use elsewhere.

The developer doesn't have a central list of the applications MyKeyFinder 2015 supports, but we found it returned keys for Windows, Microsoft Office, and products by CyberLink, Adobe, Corel, Nero, AVG, TuneUp Utilities, VMware and more.

If this isn't enough, and you already know a Registry key which contains a product licence, then you can add this and it'll be included in future reports.

In addition, if MyKeyFinder 2015 keeps displaying incorrect information then simply add that key to the "Blacklist" and it won't appear again.

www.abelssoft.net

REGISTRATION & INSTALLATION:

- Download and install mykeyfinder_cs_uk_07_2015.exe

REQUIREMENTS:

- Windows XP, Vista, Windows 7, or Windows 8
- 40MB hard drive space

LIMITATIONS:

- Registration Required

NOTE: During our testing, we were not prompted to register. However, we were provided with the following instructions if you do encounter a prompt requesting a license:

Please note, you must provide your email address to register and activate the program, but otherwise it will begin to work immediately, no "confirmation emails" or other steps are required.

XYPLORER 15.0

One of the limitations of Windows Explorer is its inability to display the contents of more than one folder at a time. While it is possible to open multiple windows to get around this problem, this is something of an inelegant solution and goes some way to explaining the wide range of Explorer replacement tools that are available.

The program includes advanced

options for working with files including an undo facility and the ability to queue up a number of file operations for efficient, sequential execution. A unique 'mini-tree' view makes it easy to access your most frequently used folders and recently used locations can be accessed via hotkeys.

REGISTRATION & INSTALLATION:

- Download and install XYplorer_15.00_Install_Creativemark.exe
- Congratulations! You have successfully installed XYplorer 15.0! No registration required!
- For support of this software, please direct your queries to: <http://xyplorer.com/support.htm>

REQUIREMENTS:

- Windows XP, Vista, Windows 7, or Windows 8
- 500MB hard drive space

LIMITATIONS:

- Non-Upgradeable License

FULL VERSION

FREE FULL VERSIONS: Each month, we offer **PC & Tech Authority** readers full registrable versions of some software on the DVD. See the installation instructions in the DVD menu to complete registration, if applicable. **IMPORTANT:** Full product registration closes on 13/07/15



DVD CONTENTS

No 212 / JUNE 2015

FEATURE + ASHAMPOO MUSIC STUDIO 5 + BACKUP4ALL 5 LITE + MYKEYFINDER 2015 + XYPLORER 15.0 **DRIVERS** + ATI CATALYST + NVIDIA FORCEWARE **HELP** + DISCLAIMER + DAMAGED OR FAULTY DVDS + USING THIS DVD + INSTALLING SOFTWARE **EDITORIAL** + BURNING AN ISO IMAGE + PC&TA EDITORIALS **TROUBLESHOOTING** + SERIAL CODES + BLANK REGISTRATION WEBSITE + CAN'T FIND A FILE? + INSTALLATION ERROR **WINDOWS** + CCLEANER + CLASSIC SHELL + CUTEPDF + DEFRAGGLER + FOXIT READER + GREENSHOT + APPLE ITUNES + LIBRE OFFICE + OPEN OFFICE + MALWAREBYTES' A/M + SANDBOXIE + VLC MEDIA PLAYER + FLUX + 7ZIP **MAC** + ALFRED + BETTERTOOLSTOOLS + APPLE ITUNES + DROPBOX + FLUX + GOOGLE CHROME + MOZILLA FIREFOX + PLEX + SKYPE + TEAMVIEWER + VLC **INTERNET** + VUZE + DROPBOX + GOOGLE CHROME + MOZILLA FIREFOX + MOZILLA THUNDERBIRD + SKYPE + STEAM **LINUX** + TINY CORE LINUX

INSTRUCTIONS: Open Windows Explorer, navigate to your DVD drive and double-click Index.html in the root directory. **DISC PROBLEMS:** To replace faulty DVDs, please send the discs to: PC&Tech Authority DVD Replacements, Level 5, Building A, 207 Pacific Highway, St Leonards NSW 2065

Make sure to include your name and postal address on the back of the package so that we know where to send the replacements. For all other DVD related issues email cd@pcandtechauthority.com.au. As the delivery platform only, PC&TA and Haymarket Media cannot and will not provide support for any of the software or data contained on these discs. Although all discs are virus scanned, Haymarket Media cannot accept any responsibility for any loss, damage or disruption to your data or computer system that may occur while using the discs, the programs or the data on them. There are no explicit or implied warranties for any of the software products on the discs. Use of these discs is strictly at your own risk.



JON HONEYBALL

"INTERNET EXPLORER HAS BEEN VERY EASY TO HATE, BUT MUCH OF THAT HAS BEEN MICROSOFT'S OWN FAULT"

With the addition of the stripped-down Spartan browser to Windows 10, is it a case of third time lucky for Microsoft?

The Windows 10 bandwagon rolls on with a major new update that includes the Spartan browser, which apparently replaces Internet Explorer. Am I pleased that IE is finally being shown the door? For sure. IE has been easy to hate, but much of that has been Microsoft's own fault. For starters, few will ever forget the implementation of IE6, wherein Microsoft decided to add special extensions that made it easier to write Microsoft-specific web apps. That might have seemed a good idea at the time, and indeed many companies went ahead and followed Microsoft's lead, only to discover that the company wasn't going to continue supporting this route.

In addition, who can forget the innumerable security problems that plagued the product over the years. Is it any surprise that many users defected to Chrome, and that Mac users are, for the most part, quite happy with the default Safari browser? It didn't help that Windows 8 introduced a weird implementation of IE in which the touchscreen version looked entirely different to the desktop one. The IE team must have been on extra-strong medicine to believe that such a screw-up would be accepted by the customer base. Oh wait, it wasn't: we hated it, and we ran away.

Spartan is supposed to bring the best of the web to both your desktop and touch devices, but first impressions are a bit "meh". I'm not wholly sold on the stark minimalist look and feel of this style of Windows 10 app just yet.

I fear Microsoft is trying to ape the design simplicity of Apple, but merely ends up making something ugly. Take a look at the new control panel area in Windows 10 for an example of this: it looks as undernourished as a catwalk model. Maybe this is necessary to make Spartan work at all screen resolutions – from large smart TVs down to small tablets or phablets – but whether it's a wise approach only time will tell. It's far too soon to form any conclusions about how good Spartan will be in the real world once it's finished, because any problems today are shrugged off with a simple "it's only a beta" excuse. But a

firmware in a drive to force it to read bad sectors and areas of disk surface. It was also highly enlightening to talk to these people who can reconstruct your data logically, despite it being spread across multiple RAID controllers or even virtual machines.

A few weeks ago, I received a small portable hard disk via courier that contained all of the data the team had been able to recover from my friend's broken drive – it was clearly identified that some of it was faulty due to corruption; that was only to be expected. On this drive was some 85GB of real stuff, 85GB more than I'd

managed to acquire (and don't forget that I'd quickly reformatted that broken drive too, in an attempt to retrieve data that would mount under Windows so I could run the basic recovery tools I had to hand).

By any standards, this service must be viewed

as a great success. Is there anything to criticise? Well, the drive sent back was encrypted using software from TrueCrypt. Nothing intrinsically wrong with this, since it certainly makes sense to send back the recovered data in encrypted form in case it falls into the wrong hands during transit.

But hasn't TrueCrypt's reputation been slightly tarnished recently among developers, who claim we should be moving away from it? In its defence, a very recent code review states emphatically that there are no backdoors or holes in this product, which was a significant concern that had been raised. Kroll lets you view the files recovered by engineers via your web browser before it sends you the disk, but it could do with updating the tools it uses – I don't appreciate being told that I have to use IE in the year 2015. I've made Kroll aware of my concerns

"The arrival of touch-based Office on iOS, Android and Windows Phone will add a new dose of creation to the 'consumption versus creation' equation"

glance at my diary says time is running out for work on Windows 10, and there are precious few weeks left before the ship has to sail, with an enormous amount that remains to be done. Still, I remain excited by this release and wonder whether it will prove to be another example of "it always takes Microsoft three releases to get things right: 8.0, 8.1, 10.0".

KROLL ONTRACK UPDATE

Last month I discussed Kroll Ontrack's data-recovery service, whose labs I'd recently visited in London. I'd sent the team a dead hard disk belonging to a friend. They took it apart in their clean room, made a diagnosis of the damage and then managed to get it up and running again, at least on three of the four platters. It was fascinating to see inside the company's clean-room facility, to watch how they could reprogram the



JON HONEYBALL

Jon is the MD of an IT consultancy that specialises in testing and deploying hardware
@jonhoneyball

➤ Expertise is worth paying for, and in an emergency, Kroll Ontrack's engineers are worth every chipset

in this area, and the company is looking into it.

Finally, I'm not aware of what this recovery effort would have cost. Hundreds of dollars, for certain. Maybe more. Was it worth it? Well, only the individual can answer that, based on what the data is worth to them. If it's mission-critical, line-of-business data, gone on Friday night and needed by 9am on Monday, then it's going to be expensive, and rightly so, because Kroll's engineers will need to work through the night. If you've been foolish enough to store your dissertation on a USB pen drive and haven't taken a backup, then you almost deserve the stinging bill that will be sent your way: there's no excuse at all for losing data today, not when we have cloud solutions such as OneDrive, Google Drive and Dropbox, often available for free (see p26 for our cloud storage group test); plus you can buy a box of pen drives for peanuts. It all comes down to your perception of risk and how lazy you are. Would I use the services of Kroll Ontrack again? Yes, if I (or more likely a client) really needed it – Kroll's engineers can do what you and I cannot, for which we should be grateful.

MOVING TO A NEW OFFICE

Another product I'm getting interested in is the latest version of Office. I'll confess I've steered clear of the beta version of "full-fat" Office for Windows because every report I read suggests that it's buggy and unstable, and not even worth installing on a virtual machine. The touch-optimised version of Microsoft Office is more interesting, because it follows the same code path as the iOS and Android versions. I've vented here before about Microsoft's blatant obfuscation of what constitutes "Office" and what you can expect from "Excel" in terms of functionality, which of course depends on which version you're talking about. But there's certainly some common "Office Lite" feel to the three touch versions, and I'm convinced that it's better to have them than not.

I think the arrival of touch-based Office on iOS, Android and Windows Phone will add a new dose of creation to the "consumption versus creation" equation that continues to plague the tablet world. For many people tablets are really only good for the "consumption" role, and they've tended to steer away from conventional "creation" beyond simple text inputs to Twitter and Facebook and lightweight



"With serious software such as Mathematica, you need to study – and study hard – to grasp enough of its basics to even get to 'Hello Worldn'"

emails. Of course, there have been office suites from various third parties on touch tablets for a while now, but the arrival of "the real deal" in the shape of Microsoft's offering will inevitably start a new level of discussion about this matter.

I won't hide my own view that an iPad or a Samsung tablet is perfectly capable of running full-fat Office, but clearly Microsoft disagrees. Might it be that the company needs to reserve full-power Office for the Windows and Mac platforms, that it actively wants to split the market and keep some things away from the cheaper end of the scale? Whatever its reason, these touch versions are useful, interesting and will be relevant to many users.

I've also been having a play with the new version of Office for Mac, which is showing promise. I'm not too happy about the major reordering of buttons and menus, but at least they're pretty consistent. I'm intrigued by the significant speed-up that's been achieved in Excel: when you give Excel 2011 a big spreadsheet to chew on, more often than not it gags and slows to a crawl, whereas in this new version it flies

by comparison (but still only bringing it level with the Windows version). I haven't moved to the new release just yet, preferring to keep real work in the shipping version for the time being – better the devil you know. But it will arrive via our Office 365 E3 subscription eventually, and proper benchmarking can wait until then.

REFLECTIONS ON MATHEMATICA

I love Wolfram's Mathematica, even though I can't claim to understand even a micro-percentage of what it's capable of. I'm impressed by what Wolfram does and how it does it, with an integrity that can't be denied. And while the same can be said of others in the field, such as Matlab, it's Wolfram that I've followed for several decades and for which I've occasionally found a real-world use.

For example, recently I wanted to find a way to quantify the amount of light reflected from the screen of a laptop, tablet or phone. If there's a diffuse screen coating, then you get a "shoulders of the mountain" effect, where there's a bright splodge in the middle and then a reducing diffusion as you move away from the bright spot. If it's a shiny screen, then you'll get a sharp reflection of the bright spot itself, and far more precipitous "shoulders of the mountain". On the surrounding area of screen you'll see all sorts of interesting things, including a reduction in the contrast ratio, but I wanted a way to measure what was happening on a diffuse screen versus a sharp, reflective one. So I turned to Mathematica.

I was aware it could read in image files and treat them as objects for its

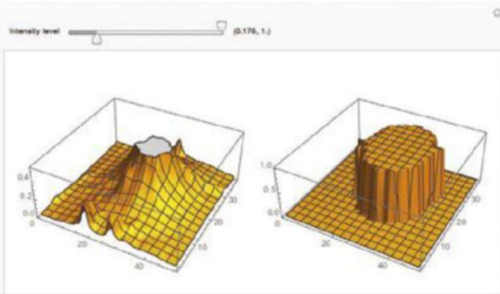


```

SetDirectory[NotebookDirectory[]];
pic = ImageResize[Import["reflection.png"], 50];
data = ImageData[ColorConvert[pic, "Grayscale"]];

Manipulate[
  Column[
    GraphicsGrid[{{ListPlot3D[data, ListPlot3D[ImageData[DeleteSmallComponents@Binarize[pic, range]]], ImageSize -> Large],
      Row[{"Binned levels: ", ImageLevels[pic, 2, range] // TableForm}],
      Row[{"Total of bin values: ", Total[ImageLevels[pic, 2, range][[All, -1, 2]]]},
      Row[{"Total of binarised image data: ", Total[Flatten[ImageData[DeleteSmallComponents@Binarize[pic, range]]]}]
    ]],
  {{range, {0.5, 0.6}, "Intensity level"}, 0, 1, ControlType -> IntervalSlider, Appearance -> "Labeled"}
]

```



▲ Wolfram's support for its product is a level above mainstream products

heavyweight maths processing. I also knew I could present them as 3D "rolling landscape" graphics, and that I could slice through the matrix of numbers. So here was my plan: import the image data and convert it to greyscale to remove colour from the discussion. Then slice through the dataset, based upon a level of, say, 0.9 brightness (with 1 as white and 0 as black). At this level, set everything below 0.9 to black and hence 0, and everything above 0.9 to be white and hence 1. Then count the number of values in the matrix, which would be the sum of the white pixels within the slice. Then I move this slice point down, from 0.9 to, say, 0.5, while repeating the calculation, and the sum will increase as the slice gets bigger. Now repeat the exercise at 0.2, compare the numbers, and see the spread of the diffuseness of the reflection.

With a product as powerful as Mathematica, it's one thing to know what you want to do but quite another to know the syntax – and unless you know the syntax, it's hard to know where to start. I'm not singling out Mathematica here. We all assume with most software that we're immediately able to gain some sort of basic proficiency, based simply on past experience with other software. Most of us can make a decent stab at getting most programs up and running, without any deflating admission that we had to read the manual.

Serious software such as Mathematica isn't like this. You need to study – and study hard – to grasp enough of its basics to even get to

"Hello World". It has more in common with proper programming languages than with simple interactive graphics tools. I'll confess that I looked long at the Wolfram documentation, which is excellent, but it's still like sitting cross-legged inside a huge library and not really knowing where to start. Whole hours, nay days, can disappear, which is frustrating because I knew what I wanted to achieve. Worse still, I knew it was something that could be achieved in only a few lines of code. The problem was finding which lines...

In the end, I did what I should have done in the first place – I contacted Wolfram's technical support. The local team took on the challenge, as did the USA group. Within hours I had two separate solutions delivered to my mailbox (I almost wondered if there was a race going on internally).

They both worked in the same way, but simply having a working solution with the right syntax meant I could now see what was going on, and dig into the documentation in a way that I could learn from. Suffice to say, it was only a few lines of code. That code is convoluted and doesn't make sense to mere mortals like me, but I can step through it and look up each component in the online help, then work out what it does. I simply didn't have the proficiency to write it from scratch, but I'm chuffed that my initial thought process was bang on target, even if I didn't have the Mathematica vocabulary to actually make it work.

Wolfram charges a fair sum for its software: a licence is US\$2,745 to buy. You can buy it on a rolling licence for US\$1095 per year, but it will time out if you fail to renew. The cost of the

support contract is the same. You don't have to spend so much: a home licence for non-commercial work costs US\$300, but it comes without a support contract and hence no rolling upgrades.

Recently I've covered a number of similar applications, and all are supplied with a support contract that offers real handholding to a level you simply won't experience from mainstream products. It's part and parcel of this type of product of course, but still, hats off to Wolfram for understanding my rambling description and then turning it into working code.

APERTURE, PHOTOS AND LIGHTROOM

We know that Aperture is dead, but Photos – the intended replacement for both iPhoto and Aperture – just isn't good enough for my needs. I've tried to persevere with it, but I find the UI of Photos – despite its initial prettiness – too confusing and somewhat trite. I need to move to something else, and that "something else" is a one-horse race: Adobe Photoshop Lightroom. It used to be the other big photo app out there, but now it's the only contender.

I've started to run some test porting of my Aperture libraries, and I'm happy to say that so far it appears to be doing a good job. I don't make a particularly complex set of edits to the lab photos we take – a mix of colour balancing, exposure, and the occasional pixel-level touch-up. Bringing across a year's worth of images is a task I've handed to the Mac Pro, which is more than able to spin up all its processors and solid-state storage to their full powers.

A feature I use frequently is tethered mode, where the camera is attached directly to the computer, usually via a USB cable. You can then operate some of the basic functions of the camera from the computer, giving a far better view of the photo that's just been taken. Initial trials show this mode is working fine with my Nikon D3X and D800 cameras, so that's a relief too.

Am I annoyed at Apple for being dumped like this? Yes I am, because I can't help feeling that pushing the boundaries in the professional space teaches lessons that a vendor can then trickle down to enhance its simpler products. The same could be said for Logic Pro, the music software, and Final Cut Pro, the video editor. However, how much of that expertise really filters down is a moot point; and do occasional users really want a dumbed-down version of something that's professional-grade? ●

PAUL OCKENDEN

"OVERCOME THE LIMITATIONS OF YOUR HARDWARE BY USING AN EXTERNAL MEDIA-STREAMING DEVICE"

Paul investigates printing options for mobile workers, looks into cheap thermal imaging, and attends a virtual wine tasting

Let's kick off this month with a question from a reader: "With the ever-increasing fashion for smart TVs and connected devices, I'm confused about the best way to store and stream my digital media. This is particularly true for movies, where for viewing on my lounge TV I need high definition and bit rate; for watching things on the go on my phone all of that bandwidth would obviously just get in the way."

What a brilliant question. There are plenty of media-streaming systems out there, but you'll find that some are better for music, others better for movies. To an extent the system you choose should take into account the hardware you already own. For example, if you have one of the first generation of connected TVs from around five years ago, it will be somewhat limited in its support for various formats of streamed media. There might be a built-in DLNA client, for example, but it's likely to be fussy about video and audio encoding, and particularly subtitle formats.

Rather than working to the limitations of your hardware, though, I'd suggest overcoming them by using an external streaming device: there are many available, and I've written about Google's Chromecast, Apple TV, and Roku's Streaming Stick before. My current favourite, Roku 3, is a close relative to the latter. It's a small box rather than an HDMI stick, it's much faster at loading apps, has a wired Ethernet connector in addition to dual-band Wi-Fi, and adds a USB port so that, at times when your network is flaky, you can plug media straight in. Best of all, the Roku 3 has a headphone jack on its remote control that I've found incredibly useful, especially for late-night TV watching. It's a brilliant bit of kit that smartens your

less-than-smart older TV.

What about a media server? Well, without hesitation I'd recommend Plex (plex.tv): there are others, but few offer the same flexibility. You can get at your media via a web interface, but the best thing about Plex is that it's a client-server system, with clients supplied for almost any device you can think of. Even in those rare cases where there's no official client,

"Plex feels as polished as a top-end commercial product, but most of its functions are free"

you'll probably find a third-party one such as the wonderful RasPlex for the Raspberry Pi. Likewise, there are apps for all the main mobile platforms.

Being client-server-based means that the player can negotiate with the server about the format it needs: if you're watching on a phone, for example, it will automatically transcode the video stream into a more suitable format. Likewise, if your files contain a 5.1 soundtrack but you're viewing on a tablet with stereo speakers, the Plex client and server will work everything out so you receive perfectly good two-channel

audio. It all works brilliantly well.

The server side of Plex is usually run on a PC. It can also run on a NAS, but be aware that, unless it's a top-end NAS, there may be some limitations.

Plex doesn't only serve up media files, but will also grab descriptions and artwork online, generate thumbnails, download background audio tracks and so on. It also neatly organises your files – not only TV shows and movies, but audio files too. The whole ecosystem feels as polished as a top-end commercial product, but most of its functions are free. There's a paid-for version that adds a few bells and whistles, such as syncing between devices, and some of the clients must be bought, but most are free if you subscribe. Long-term Plex users might be rolling their eyes at this point, because the subscription fees increased considerably last year, but at US\$4 per month, US\$39.99 per year, or US\$149.99 for life, I think they're still great value for such a quality product. (If you're going to stick with the free version, keep an eye on the various app-store sales, which sometimes offer the Plex client at a discounted price.)

SOLAR MONITORING REVISITED

Almost three years ago, I wrote about the online monitoring and reporting system offered by a wireless solar-panel micro-inverter manufacturer called Enecsys. Much has happened since then. Enecsys has gone to the wall, and the

> The Roku 3 is a brilliant media-streaming player, and does much more besides



PAUL OCKENDEN

Paul owns an agency that helps businesses exploit the web, from sales to marketing and everything in between [@PaulOckenden](https://twitter.com/PaulOckenden)



online monitoring tool has started to misbehave: frankly, I don't expect it to be around for much longer. So what can owners of these devices do now?

The Enecsys monitoring facility offers two main functions. The first is to confirm that all of your micro-inverters are working properly, and the second is to give you pretty graphs and reports of how much solar power you're generating. To check your micro-inverters are working, look at the display on the front of the gateway device that should be plugged into your broadband router. This shows the number of micro-inverters currently powered up and active – for my own installation, this shows “8” during the day and “0” at night.

If you want to dig deeper, you can connect a web browser to the gateway (the username is “admin” and the password is “password” – just like a zillion other devices out there, sigh!). From there you can click on “debug information” to view a list of the micro-inverters connected, and you can even watch the data packets that these devices generate. If you're interested in the format of these packets, take a look at the Perl script in this forum post (tinyurl.com/oh2nsgx). If you want to continue monitoring your system, you could use that Perl script with some graphing tools, but a far easier solution can be found by using a combination of two other tools.

The first is the Solar DataCollector service from Germany-based Aloaha, at dataservices.solar, which records the output from your solar panels and takes the place of the original Enecsys gateway. It's not free, but at \$70 per year it's hardly expensive. You can also buy the software and run it locally if you'd prefer. The second part of the solution comes in the form of **pvinfos.org**, a free-to-use Australian website where people can upload their energy generation (and, indeed, consumption) data to see it presented in graphical format – it's very different from Enecsys, but in some ways more functional.

You can add other items to this graph, such as your electricity and gas consumption, although obviously you'll need monitoring gadgets of some kind: take a look at either Flukso or OpenEnergyMonitor. You can also add your local temperature via a feed from Weather Underground. While it's a shame that Enecsys is no longer with us – I thought it had some great products – by using the above tips you can hopefully carry on monitoring your energy generation and usage, and maybe even improve it.

WIRELESS IN THE REAL WORLD

Around a year ago, we received an email from reader Alan Ingram with a plea for help. He wrote: “One aspect of Wi-Fi technology that seems to have been forgotten about is point-to-point connections. I'm responsible for two sites that employ point-to-point Wi-Fi to link buildings. Both have challenges of distance, line-of-sight and so on. But after a lot of messing around, the best solution I came up with has been a pair of Buffalo WHR-HP-G54 running DD-WRT connected up to D-Link ANT24-2100

“I've gone from Windows file transfers of about 2MB/sec with the old D-Link kit to pushing 50MB/sec”

21dBi directional 11g grid antennas. This gave me a reasonably quick connection (a little over 20Mbps/sec) over a few hundred metres, even when line-of-sight was iffy at best.

“However, this kit is now seven years old. With VDSL I could theoretically achieve similar speeds by routing the data halfway around the country via a consumer-level broadband connection to each building; there must be a better solution now?”

“The problem seems to be that most of the advances in Wi-Fi are around MIMO, which require a router looking like a Christmas tree, with more and more antennas. This doesn't lend itself well to directional antennas from what I can gather. Has there been a wireless standard or router since 802.11g that's

✓ A combination of Aloaha Solar DataCollector and PVOutput is a good alternative to the soon-to-be-defunct Enecsys gateway

designed for single antennas, that allows better stability and throughput than 802.11g?”

Alan is founder and technical director at ePartner Consulting in Lightwater, Surrey, a company that's heavily into areas such as business process management, workflow automation and data capture. The company uses its site-to-site wireless link mainly for things such as VM replication, where Alan reports that the initial copying can take days.

I don't normally get involved with reader queries this specific, but this particular case piqued my interest. Alan mentioned that Wi-Fi bridges don't use MIMO technology, and many believe this, but it's not true. It may look as though a point-to-point link contains only a single antenna, but often they'll contain several, albeit much closer together than with a typical domestic or SME-focused wireless access point (AP). I pointed Alan at the kit available from Ubiquiti Networks, and in particular its NanoBeam outdoor APs.

I've found these to be very effective for point-to-point wireless links, as well as being relatively inexpensive. The NanoBeams are an update of Ubiquiti's earlier NanoBridge/NanoStation units, which I'm sure some of you will be familiar with. To give an idea of price, the NanoBeam NBE-5AC-19 (which, if we decode the model number, is a 19dBi antenna with 5GHz 802.11ac wireless) retails for around US\$100 per end.

Alan told me he wasn't particularly impressed with Ubiquiti's support and advice; the manufacturer had just passed him off to resellers that either didn't have the details he needed, or didn't care. I guess that's one of the pitfalls when buying kit this cheap – there's no margin to pay for a decent pre-sales function. However, there's an excellent community forum at community.ubnt.com. Alan



found several people there who were able to guide him in the right direction. He reports that “the results are good. I’ve gone from Windows file transfers of about 2MB/sec with the old D-Link kit to pushing 50MB/sec. I suspect with a bit of fiddling I may be able to achieve slightly better, but I’m happy for now.”

That’s quite a result! You can follow Alan’s real-world journey via the following community forum post: tinyurl.com/nvczydc.

A TALE OF TWO NASES

I’m going to stray slightly into Steve Cassidy territory here, particularly as he talks about the value of more expensive NAS drives in this issue – but from a very different angle. It all started when a friend asked me how much difference there is between a high-end NAS and a much cheaper one. He’d decided he wanted one mainly to store local backups, but also for storing his photos, an extensive music collection, and the occasional, erm, “downloaded” movie.

Now it just so happens that I have a couple of four-bay NAS units from both ends of the price spectrum sitting just across the office from me, so it’s easy enough for me to examine the differences. At the lower end I have a ZyXEL NAS540, which you can pick up for around \$300 without drives, and sitting next to it is a Qnap TS-470 Pro, which at the other end of the scale weighs in at around \$1200 for the chassis alone.

That’s a huge difference in price – but are these devices so different? Well, physically they’re of a similar size

▼ ...but a more expensive model such as the Qnap TS-470 Pro is effectively more of a mini server

to all 4-bay NAS units. The NAS540 has a plastic case, whereas the TS-470 Pro’s is metal, and there’s quite a weight difference between them too – the Qnap at 4.6kg and the ZyXEL less than half that – although this becomes less noticeable once you’ve loaded them up with hard drives.

Incidentally, don’t skimp on those drives, and certainly don’t be tempted to use desktop drives in a NAS. There was a famous report from a cloud storage company a couple of years ago that claimed that desktop drives were just as reliable in its environment as NAS or enterprise drives. But my experience doesn’t match that: I’ve found drives targeted at the NAS market are far better than desktop drives, and that proper enterprise drives are better still. As well as closer manufacturing tolerances and better testing, I think it’s also down to temperature (four drives sitting in a small enclosure can get fairly toasty) and vibration.

The latter is particularly important as you can get all kinds of resonances between four closely coupled hard drives, and enterprise drives seem far more able to cope with such things. I’m a fan of WD’s Re drives, but if you can’t afford those, look at their Se drives, and as a last resort the Red drives. The Reds come with only a three-year warranty, as opposed to the five years offered with the Re and Se units, and

although that’s probably partly a matter of marketing, I reckon it also reflects the manufacturer’s confidence in its drive-failure rate.

But back to those NAS boxes. In hardware terms there are some fairly obvious differences: the NAS540 trundles along with a dual-core 1.2GHz Freescale (ex Motorola) FSI024 CPU and 1GB of RAM, while the TS-470 Pro goes down the Intel route with a dual-core 3.3GHz Core i3-3220 CPU coupled to 16GB of RAM. Both have Gigabit Ethernet ports. As a

simple file store or backup device, there’s little to choose between them, and if



▲ A low-cost NAS such as the ZyXEL NAS540 is perfect for local backups and other light duties...

that’s all you need, then I think the ZyXEL would be perfect.

EXPANDED FUNCTION

Both NASes come with several built-in services such as backup systems (including support for Apple’s Time Machine), cloud synchronisation and media serving, and also allow you to download further prepackaged apps. The range of apps available for the Qnap is far larger and more fully featured – you can compare them at tinyurl.com/q3ftq83 and tinyurl.com/pxvfhou – but if your needs are modest you’ll find all that you need on ZyXEL’s list.

There are a couple of areas where the Qnap wins hands down, though. The first is as a virtualisation station. With its Core i3 processor and 16GB of RAM, it’s perfectly feasible to run VMs on this NAS; I have Window Server running on mine, looking after various home-automation tasks. This is completely out of the question on the less powerful ZyXEL NAS540.

The other area where the Qnap comes into its own is as a media server. Both can run a media-server system such as Plex, but on the ZyXEL you’ll be restricted to playback via direct streaming. The extra grunt on board the Qnap enables the NAS to perform real-time transcoding of both audio and video, and even with 1080p media files it won’t drop any frames. Normally you’d need to be running Plex on a fairly recent and grunty PC or Mac to have such flexibility.

Ultimately, which NAS you choose will be based on what you need it to do and your budget. These certainly aren’t the only models on the market – and indeed Qnap’s range of models is mind-boggling – but they’re certainly both units that I’d highly recommend. ●





PAUL HUME

"I WANTED A SYSTEM THAT WAS FLEXIBLE. I WANTED A MODERN USER INTERFACE - AND I WANTED IT MOBILE!"

Done right, CRM software can make a huge difference to a company - saving time, improving customer relationships and making more money

A few years ago, our IT department convinced the Marston's board that we needed a customer relationship management (CRM) system. Build our all-new maintenance helpdesk on a CRM platform, the argument went, and we'd have a system we could showcase to the sales teams. And once they saw it - well, game, set and match! How wrong they were.

You see, we picked SAP CRM. A logical choice when your enterprise resource planning and payroll systems are all SAP, and we ended up with a helpdesk that served us well for five years. However, unless you use the standard out-of-the-box screens, SAP systems generally require specialist development - and that costs rather more than I'm willing to pay to simply demo a system someone might want to use in the future. It's safe to say that our sales team wasn't convinced of CRM's merits.

Fast-forward five years and our CRM system was in need of an upgrade. It was out of support, and the newer version simply wasn't compatible with the developments our in-house team had made. This time I was in a position to influence decisions, and I wanted a system that was flexible, one that was easy to change. I wanted a modern user interface - and I wanted it mobile!

We looked at all the major vendors. Salesforce (force.com) was a real contender: its UI is good, and it has some great features as standard. But I have a team of .NET developers, and Salesforce's platform for custom developments is based on Java. While Salesforce has now introduced a .NET UI, converters are never the same as building

in the native language. Then there's the whole Microsoft stack that we have across our userbase. I wanted our CRM system to work seamlessly with Office, Outlook, Lync and SharePoint. Step up Microsoft Dynamics CRM.

It could be argued that Salesforce is a more mature product, but Dynamics met all of my requirements - and with an upgrade every quarter, it gets better and better before your eyes. Then there's the price. An enterprise licence is cheaper than the equivalent Salesforce licence; less than half the price, in fact.

Today we use Microsoft Dynamics CRM across many different applications and user groups. People think of CRM as just customer information, but it's far more. Dynamics CRM is such a powerful platform that we use it for those developments where traditionally we'd have written some bespoke software. For example, we use it to log people showing an interest in taking on one of our franchise business models. It's a really simple solution that was built in a few days.

CUSTOM-CENTRIC APPROACH

One of the strengths of Dynamics CRM is the ability to create custom entities. An entity is an object such as an account or

a contact, and a CRM system will have many standard entities. However, there are occasions when our requirements don't quite fit the standard model, and Dynamics CRM allows us to create new entities without the need to code. It's a simple bit of configuration that doesn't require a developer. (That said, I wouldn't advocate giving this to business users, as an understanding of system design and entity relationships is vital if you don't want to get into a mess.)

This ability to create custom entities really helped us manage franchise applications. We use leads to capture the applicant details, but we wanted to know if people had applied more than once. Now, a lead is a person and you want only one copy of a person - for example, if you're emailing everyone who's applied more than once, they don't want multiple copies of the same email. Besides, the deduplication process would merge them into one record anyway. So we created a custom entity called an HR application and linked an application to a lead. Thus, someone who's applied three times would have three HR application records but only one lead record. We also link the application to accounts (pubs in

▼ Marston's operates more than 2,000 pubs in the UK



PAUL HUME

is development manager at Marston's, where he focuses on making the most of emerging technologies



“The ability to create custom entities really helped us with franchise applications”

our case) so we can track applications against pubs and not just people.

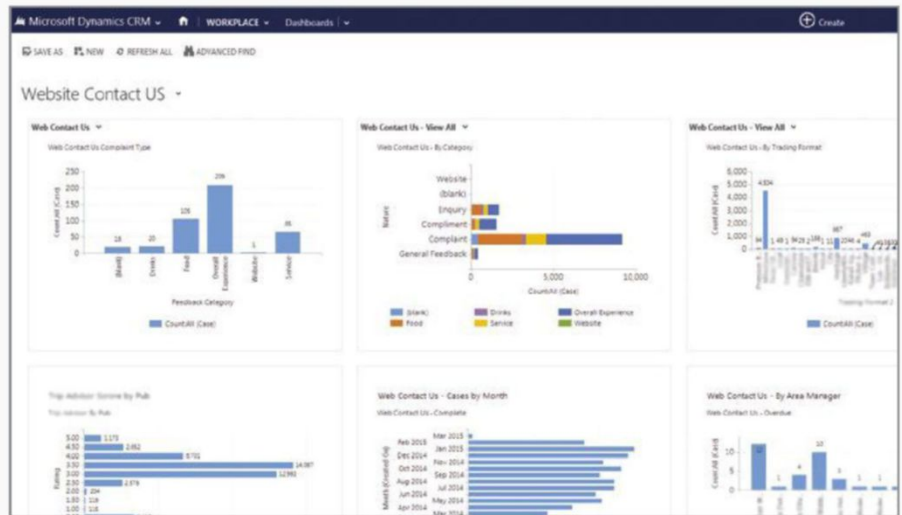
We then serve up all of this data to the recruitment team using one of Dynamics' finest features: its dashboards. Not only are these easy to create, you'll soon learn to love their drill-down capabilities. As an example, we might add a chart to show applications by region. That brings up a nice little bar chart, and by clicking on one of the bars you can then select any associated field to filter that data. So, if I click on the bar for the North East, I can select the available capital field and it will automatically redraw that chart using only data from applications in the North East, and then cutting up that data by available capital.

The really fancy bit is that I can then click a button to add a table of data next to the chart and, when I click on one of the bars, it will change the table to show only the data relating to that bar. I can then drill into the actual application by clicking on a record within the table. This is true reporting, and puts some business-intelligence tools to shame.

Another great feature of Dynamics is the workflow engine. This allows powerful workflows to be created and, again, it's easily done without a developer thanks to its point-and-click tools. Workflow isn't just about sending email alerts to people: it can also be used to create new records, set fields, anything really you desire.

I do have one gripe, however. While the Workflow Editor tool makes it easy to create a workflow, it's a nightmare if you want to make a substantial change. For example, you may have created a condition that sends an email, and all you want to do is move the location of that condition – maybe take it out of an if statement. Well, you can't. I expected a drag-and-drop feature, at the very least a Move button, but neither exists. You have

✓ It's also possible to integrate charts into the main account screens; here, we're looking at the amount of ale sold to a cricket club over the course of a year



▲ The way Dynamics displays data will be instantly familiar, with its easy-to-understand dashboard backed up by great drill-down capabilities

to delete and recreate it. While it may not take that long, it adds risk and therefore requires a full re-test.

I thought I'd found the answer to this problem, as I discovered there's a way to edit workflows to get around this issue. You can export the workflow as XAML, edit it and re-import – with the proviso that once you've done this you can't then go back to the built-in editor. I was quite happy with this approach... until I discovered that it can only be done in this way with an on-premise implementation.

Microsoft really needs to address this: it's the only thing that annoys me and my team about Dynamics. But with the constant updates, I'm quietly confident that this will be sorted soon.

Talking of updates, Microsoft releases updates every quarter: two big updates and two smaller ones. The whole process is fairly painless if you're using Dynamics CRM Online. You get to choose the date of your upgrade, you receive all the notes in advance to make you aware of the changes, and you can schedule your sandbox to be updated ahead of your live environment. You can therefore assess the impact before you upgrade the live environment. When the day comes, it's simply a matter of waking up to an upgraded system.

ONE MORE FOR THE ROAD

As I mentioned, one of my main requirements for a new CRM system was mobile availability. A CRM system is only as good as the data it contains, you have to make data entry as simple as possible.

That means I don't want our salespeople having to take notes on paper and then add them to the CRM, and I don't want them having to boot

up laptops when they climb back into their cars. I wanted to give them the ability to view and enter information via a phone or tablet. Before they walk in to see a customer they can have a look at the latest information via CRM on their phone; when they've finished they can add a few notes via their phone or tablet. All as quick and easy as sending an SMS.

Well, that's what I wanted to deliver, and I was happy to see a few options. The first and most obvious is Microsoft's app for CRM. It isn't bad, but it's clearly a mobile website that's been wrapped into an app – at least that's the case on iOS. The Windows Phone version is a little better, but it's still a similar experience. Don't get me wrong – it works, and the app gives you access to plenty of functionality. In fact, in Dynamics CRM there are dedicated mobile forms, meaning customisation for the app is done within the CRM and using the standard customisation tools. My biggest issue is the lack of offline capabilities.

Resco Mobile, on the other hand, offers everything we need. A native app available on multiple platforms, easily configurable within a CRM plugin and all available offline. Our sales teams love it and, to be honest, without this app I'm not convinced we'd have had the same take-up by staff, making my job of rolling out CRM significantly more challenging.

Microsoft is releasing new apps all the time, and mobile is definitely on its roadmap. The great thing for me is that when the standard product set isn't quite up to the job, there are partners offering solutions in the marketplace, making Dynamics CRM a very powerful system to use indeed.

So, overall, our CRM journey with Microsoft Dynamics has been an extremely pleasant experience so far, and I have many plans for the future too. Am I pleased with the decision? You bet I am. ●



DAVEY WINDER

"I CAN'T FOR THE LIFE OF ME FIGURE OUT WHY FACEBOOK DOESN'T JUST BAN SHORTENED URLS AND LEAVE IT AT THAT"

But in the meantime, the best course of action to protect yourself from malware is to avoid clicking on unsolicited links

My attention was recently drawn to some malware that used, among other things, shortened (and therefore obfuscated) URLs as part of its distribution mechanism. This variant of the "Kilim" family of malware employed a typical tactic: posting a Facebook link that promises porn but actually leads straight to a malicious executable. The URL in this case was shortened using the ow.ly service – which, of course, isn't complicit in the attack – to hide its real address, which in turn redirected to another shortened link that eventually arrived at that malicious executable.

Facebook took swift action to block all links associated with this malware distribution, but it raised the question of why it allows shortened links at all. While Facebook monitors links posted overtly for malware distribution and spam, the Kilim affair demonstrates this won't catch all such bad links before users get burned, and I can't for the life of me understand why it doesn't impose an outright ban.

After all, there's no real reason for them inside the Facebook system; unlike Twitter, whose 140-character limit makes shortening almost mandatory. Twitter dealt with the problem of malicious short-form links by banning the use of third-party shortening services, using its own t.co service instead. This enables Twitter to check the converted link against a database of known potential dangers and so protect its users. While it still isn't 100% perfect, it does plenty to mitigate the risk of being directed to a malicious site. I asked Facebook why it hasn't followed Twitter's lead in order to protect its users, but am yet to receive a response.

In the meantime, if you want to protect yourself from the risk of obfuscated URLs on Facebook (or elsewhere), then the usual rules apply: don't click on unsolicited links, especially those promising adult content. You could also employ a short-link revealer in your browser: there are plenty of plugins and extensions that will divulge the true destination of a shortened link just by hovering over it. This lets you check the permissions being granted, in the case of Chrome extensions for example, and understandably you'll see that they all need to "read and change all your data on the websites you visit".

Now I'm not suggesting for a moment that something bad must always come from this, but those kind of permissions always scare me, especially when I'm dealing with relatively unknown quantities rather than trusted large security vendors.

Instead of installing a plugin – and I'm not aware of any for smartphone users anyway – I'd rather go to one of the many link-revealer sites and paste the shortened URL into it for expansion. It takes longer, which for many people will immediately disqualify it on the grounds that security that reduces usability is worse than no security at all, but how much is 30 seconds of your time really worth? Unless you're clicking shortened links all day long (in which case you're probably also prone to licking windows and scribbling with crayons), I can't believe that it's too much of an inconvenience for the added layer of security. Until Facebook can be bothered to do something about this problem, or even to acknowledge that it exists, it may be your safest option.

a fundamental misunderstanding, the widespread conflation of privacy with anonymity, which has led to the clouding of the actual purpose of a VPN. Let's start by clarifying this.

Simply put, a VPN is a private network that tunnels through a public network, such as the internet. The data passing through this tunnel is encrypted, meaning that anyone trying to spy on what you're doing will see only the tunnel and not the traffic itself – and that's where the "private" part of the name comes from.

To be more technically precise, the VPN hooks into the local OS's network stack and sends all external IP traffic via the VPN. This ensures it's all encrypted, so that when you connect to any external server or website it can see only your VPN IP address, while your real IP address remains hidden. These two aspects of the VPN – encryption of data traffic and cloaking of your IP address – are what gave rise to the modern myth that using a VPN offers a free pass to participate in illegal activities.

It's fair enough to assume that using a VPN will prevent any would-be public Wi-Fi hotspot sniffers from grabbing your logins out of the ether, and it can even stop law-enforcers from seeing precisely what data you're moving about. However, this is privacy, and not anonymity, because your VPN provider not only knows who you are (depending on how you've paid them, billing data will be stored) but, more importantly, also knows everywhere you've connected to and from, along with the dates and times of that activity.

This is where some folk have come unstuck in the past, by assuming that

✓ Anonymizer uses the OpenVPN protocol, but does that guarantee real anonymity?



DAVEY WINDER

Davey is an award-winning journalist and consultant specialising in privacy and security issues. [@happygeek](#)

THE TRUTH ABOUT VPN ANONYMITY

The problem with virtual private networks (VPNs) is that people mistakenly think they're also virtual anonymous networks. This confusion arises through

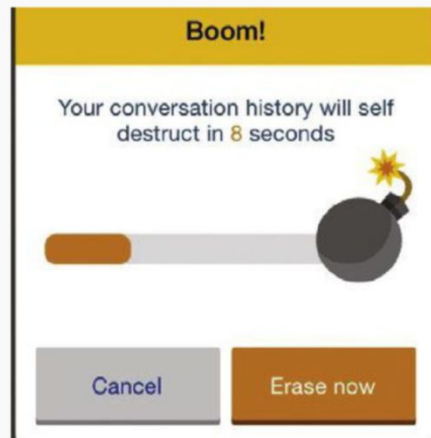


using a VPN automatically guaranteed anonymity. Perhaps the most infamous case was convicted LulzSec hacker Cody Andrew Kretsinger, also known as "Recursion". Following his arrest by the FBI in 2011 (he was subsequently convicted in 2013), it emerged that Kretsinger had used a popular VPN (Hide My Ass) to remain anonymous while hacking into the servers of Sony Pictures Entertainment. A UK court order was issued requiring London-based Hide My Ass to disclose the IP address used by Recursion to log in to its VPN service, to which it complied. The Ts&Cs of use for the VPN clearly stated that this service wasn't to be used for illegal purposes and, furthermore, that the company would co-operate with law enforcement should a court order require it to do so.

Bypassing censorship is one thing that VPN services are recommended for, be it at governmental or corporate scale. Political protestors and consumers of streamed video alike successfully use VPNs to circumvent blocks put in place to prevent them from accessing banned or regionally restricted material – just don't expect to remain anonymous, in the generally accepted sense of your identity being untraceable, while you're doing it.

How traceable your identity is will vary from one provider to the next, so you should always read the privacy policy and terms of use before signing up. Understand that privacy is your ability to control who sees what you're doing, whereas anonymity is your ability to control who sees that it's you doing it, rather than what you're doing. If all you want to do is protect the security of your connection while using public Wi-Fi in a coffee shop, then any VPN provider will be fit for purpose. The same is true if you want to find a way to circumvent region-restricted streaming of sports or television content. However, if it's true anonymity you're after then, frankly, you may well be onto a loser with whichever service you ultimately choose.

Personally I'd opt for a service that supports the OpenVPN protocol, since this is by far the most secure; Layer 2 Tunneling Protocol (L2PT) using IPsec comes a close second; Point-to-Point Tunneling Protocol (PPTP) is best avoided since it's already been hacked to hell and back. I'd also scour the Ts&Cs with a fine-tooth comb, looking for the answers to a few important questions. The first would be what is logged and how long is it stored for? Most will log your originating IP address, along with those of the websites and servers to which you connect. Look for how long this data is kept: the longer it's stored, the more opportunity there is of it being subject



▲ Nice graphics, but a court order will reveal your identity

to disclosure through the legal process. Some VPN services will state that they delete such logs within the hour, and some won't link them to your originating IP address.

Although this would protect your anonymity should a court order demand disclosure (after all, they can't access what's not there), it doesn't mean that these services are providing truly anonymous connectivity – if a court order is raised to start logging the activity of your account, that's a different matter altogether. I'd want to know what happens in such a case, and the VPN privacy policy should state whether or not users would be notified of such a request. Also, don't forget that your ISP is perfectly capable of determining that you're connecting to a server operated by a VPN service, as well as the volume of traffic passing through it, and it too may disclose this information about your activity if requested to do so by a court.

You're probably wondering what VPN services I'd recommend, and to be honest, that's a difficult question to answer since it depends on your expectations for such a service. Hide My Ass remains the biggest VPN service out there, with more than 800 servers in 182 countries and 113,000 IP addresses. It's easy to use, stable across devices, and I haven't found there to be much slowdown in speed when connecting through it. If it's pure security and privacy on public networks you're after, then Hide My Ass remains a decent choice, so long as you're not expecting something that also nods in the direction of anonymity. If the anonymity angle is what's most important, then you could try Anonymizer Universal, which is just as reliable as Hide My Ass in terms of connectivity and speed. It also hits big on the anonymity promise and insists that it doesn't log any traffic, period.

What it does log is the originating IP

address along with a timestamp, but this log is purged every 24 hours – and Anonymizer doesn't log when a user disconnects or where they visited while connected. It does state that it complies with court orders, but since it doesn't log traffic or store connection logs beyond 24 hours, there's little data it can hand over.

Users can be connected to billing information, so access to the service can be confirmed, but there's no way to connect specific users to specific traffic. On the downside, setting it up on Android/iOS involves rather more than merely downloading an app and pressing start: you need to install the OpenVPN profiles and point to those. However, online guides are clear and concise, and *PC & Tech Authority* readers will have no difficulty in working it out.

VIRTUAL BURNER? THERE'S AN APP FOR THAT

The same company has also launched a kind of VPN for your smartphone. Sure, you can run Hide My Ass as a VPN on a smartphone for accessing the internet as described above, and Hide My Phone brings this kind of privacy to your telephone calls too. The concept of a "burner" phone is nothing new: criminals and love rats have been using them for years to cover their tracks. Even burner phone apps aren't that new: "Burner" has been around for some years. However, Hide My Phone was new to me so I thought I'd give it a spin, seeing as I've just been writing about VPNs.

If you're in the market for such a tool, you can have multiple burner phones in one handset by simply renting numbers using Hide My Phone. The numbers – you can rent as many as you like – need to be renewed each month or they're quarantined for a couple of months before being made available again. The fact that these numbers are reused could become problematic for some users, especially as the quarantine period isn't that long. Still, if you're after something that can hide your real number and erase both call and message traces at the press of a button, the costs may be worth it.

Not that this service is designed to aid criminal intent, and just as Hide My Ass was involved in providing information during that LulzSec investigation, so Hide My Phone data can be used to help law enforcement if a court order demands it. Logs are kept that can attribute calls to and from any Hide My Phone burner number back to the user account, and onward to the unique user device ID of the smartphone concerned. So not really as anonymous as users think, despite their "self-destruct" button, which erases on-device call and message histories. ●



STEVE CASSIDY

"A USER IN A NON-TECHNICAL ROLE ENDED UP IN HOSPITAL THANKS TO THE STRAIN OF ALL THOSE LATE NIGHTS"

Some technical decisions have very non-technical consequences
– and are often based on little more than opinion

I'm going to have to dance on eggshells a bit here: on the one hand this is a forehead-slapper of a support story, while on the other it contains a little nugget that conclusively identifies almost everyone involved, which is something I try to avoid, not least so that my source of such stories doesn't dry up altogether. So let me see whether I can get my point across technically, and perhaps make you forget about the little nugget.

One of my former clients had what I thought at the time was a very peculiar attitude to virtualisation. We're talking about the pre-cloud epoch here, so this peculiarity could have been excused, except that it's so symptomatic of a state of mind that I continue to come across – and a state of mind that has distressingly little to do with any calm technical appraisal of the pros and cons of a particular choice. Actually, it was far more similar to the way people define their social class by the brand of car they drive – as beautifully and clairvoyantly summarised by that wonderful TV sketch of the 1960s that featured John Cleese, Ronnie Barker and Ronnie Corbett.

In the case of my ex-client, we had a very senior man who had researched virtual machines at the very highest level. He'd seen the way of the future without any shadow of a doubt, as evidenced by his personal laptop suddenly sprouting a copy of VMware Workstation. This was spotted by his IT team leader, who was pretty much the opposite of clairvoyant. Rather, he was the kind of guy who could spot intruding software or peculiar configurations from across the room;

then, he'd refuse to let go of the offending user, worrying them like a terrier, until they'd fully accounted for themselves. Courageous then, but not necessarily adventurous with it.

I realise that none of this sounds particularly technical. My first point is that, unlike more physical disciplines such as being a truck mechanic or an oil-rig worker, IT has room for mere opinion to triumph over the hardest of facts. In this case, the opinion formed by the IT team leader was that all this virtualisation nonsense was getting out of hand, and that if a proper world-famous guru thought it was a bright idea then the likes of him wouldn't stand a chance of using it or living with it successfully. He'd decided he was dead against it. That left it up to me to oversee the first round of virtualisations, and the second... and the third. Each time there was a tiny hiccup – such as the one where we ended up editing the VMDK parameter file four minutes before the users were due to be let back into the machine – the IT team leader would be a looming presence, staring fixedly at his own screen but firing off the occasional cynical aside apropos a set of machines on the opposite side of the room.

Incredibly enough, some years after I'd parted ways with this client, I discovered that he'd not simply been sceptical about the direction taken by the whole of the rest of the industry, but he'd actively reversed the trend: the company's server count jumped up sharply, its licence deal was renegotiated to allow more hardware boxes, and all the old VMs were swept away as soon as their *raison d'être* could be questioned.

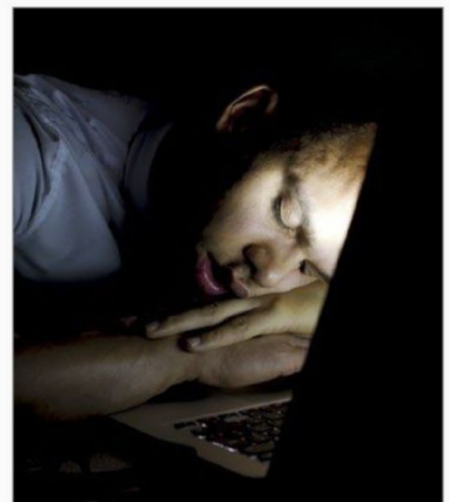
Some of this came to pass because the database vendor used by this client also had a down on virtualised machines, but that arbitrary legal distinction had spread far beyond the collection of servers used for database work. It was a strange business to watch, from the

original, defensive assertion that "it must be complicated if he likes it" through to the deliberate "I reckon I can swing this if I start with the databases". I don't think the man in question was in cahoots with the hardware supplier: I think he'd talked himself into a trap half a decade long, whereby his initial reaction became tied up with fear of loss of face.

NON-TECHNICAL CONSEQUENCES

The recent incident that took me back to this episode is linked to it by, again, nothing technical. I was always aghast at the way my client's internal IT man would give up whole evenings and weekends to the slow, drudge-like consequences of his initial decision. Late nights and missed holidays are frequently taken to be a sign of dedication, plugging away at some terrible, inevitable, sadistically constructed technology limitation. "Sorry mate, that's how long ESEUTIL takes – get in the pizzas." "This recovery will run all night, I'll have to work right through." That horrid 2am panorama of lights still

▼ Late nights at work are seen as a sign of dedication, but they're often avoidable



STEVE CASSIDY

Steve is a consultant who specialises in networks, cloud, HR and upsetting the corporate apple cart [@stardotpro](#)

on in offices across the country.

The consequences of this approach to work aren't difficult to observe, even if you're one of those strange people who believes that drinking coffee for 18 hours improves your decision-making and diagnosis skills. In the case I stumbled upon recently, a humble

"When someone gets a gawp out of me it's a matter of professional pride to return the favour"

user in a completely non-technical role ended up in hospital thanks to the strain of all those late nights and pressured deadlines. I agree that this is still some way from getting technical, but my whole point is to try to show how incorrect technical decisions show up in very non-technical ways. The "stay late" culture is definitely one of the biggest red flags for any business, showing that it's putting itself at risk in all sorts of ways simply by believing that there's no stronger rationale for any IT decision than tossing a coin or going with the social vogue.

I didn't understand the technical roots underlying my friend's overwork problem until we sat down to set up a laptop with them (ignore the slightly odd sentence structure, because the identity-protection tiptoeing begins here). I'm terrible at setting up laptops because I lack the patience to put up with bloatware, and have very little idea about commonly used, heavily advertised "consumer" antivirus platforms. Generally when someone says "but I thought XYZ antivirus stored my credit card against identity theft?" I'll look entirely blank, because that's the kind of thing I'd never put up with. I'm thinking more about how to get the best battery life out of the disk and the right power-management drivers.

In this case, I knew the user was coming from an environment that's rumoured to be the inspiration for a certain famous TV sitcom about computing, so I really had very little idea what to expect in terms of the assumptions in this user's mind about technology in general and the sort of people who deliver it.

That fog of confusion lasted about ten seconds until the user asked me: "What version of Java are you using?" At this point I may have gawped. "Oh I know all about that," they said, "I was an administrator on my laptop because I had to be able to install and remove



different versions of Java according to which data source I was using. Our platforms were all web-based, but none were independent of the Java on your laptop. Many late nights spent trying to work out what version a given platform had moved to and doing the uninstall/reboot/reinstall cycle."

When someone manages to get a gawp out of me it's a matter of professional pride to return the favour, so I fired up VMware Fusion Pro on my Mac Pro workstation (hex-core 5500 Series Xeon, 24GB of RAM, three SSDs, three spinning disks and OS X Yosemite – thanks for asking) and demonstrated how to run five Windows 7 VMs side by side, a mixture of 32- and 64-bit, running a mixture of application suites, browsers and antivirus utilities, and all pointed at the same shared folder sat on a separate partition. It didn't take very long for the penny to drop that this was no Mac-specific or desk-side-PC-specific party trick, and that it wasn't even all that expensive to achieve.

Astonishment quickly turned to fury as this user began to figure out just how much of their life had been lost to trudging pointlessly through those myriad remove/install cycles, due to the indolence/malevolence of their IT support functionaries who had imposed them almost as a kind of punishment for the (quite reasonable) demands of their job function.

Of course, it's great fun to watch sitcoms in which people make a joke out of Kafkaesque, nightmarishly pointless, ritualised business behaviours. A little of this can't-be-helped, computer-says-no, fatalistic *schadenfreude* might feel as

▲ If you're always the last person in the building at night, something's gone wrong

though it lightens the load of one's own cares and woes. But look where you end up through believing that there can't be a better solution, or that a solution is for "gurus only" and that such gurus are inherently unsafe in modern business. All those office lights still on at 2am. All those pasty-faced, unhappy people who are so log-jammed as a consequence of their bad choices that they think this is the normal, expected state of affairs. That's not what IT is supposed to be about. It's what puts companies off running their own internal IT service and sends them out onto the unsafe consumer web simply to get their lives back from foolish, paranoid company restrictions.

I often think that the characters and situations I uncover would make the bones of another cracking sitcom. However, as IT becomes progressively more crucial, and hence IT mistakes have progressively worse non-technical consequences, I can't help also thinking the directors of the business that really was the basis for a comedy show ought to take that as an insult. At the heart of a lot of comedy lies an equal amount of genuine despair.

NETGEAR NAS JUMPS UP A LEVEL

In a continuing spirit of trying to do myself out of a job, I persist in trying to show people what's available on the slightly higher branches of the product evolutionary tree. So many of those late-night office stays I was just bemoaning



are caused by buying kit from the very bottom of the market. People have built up a resistance to the idea that there's any difference between these basic devices and more expensive ones with added "bells and whistles". This is simply a variation on the old conspiracy theory that all the world's computers are – like all the world's washing machines or DVD players – made in the same enormous oriental factory, and you're a mug if you pay more for a smarter badge.

This theory just doesn't bear close examination once you've strained your back muscles by heaving the Netgear ReadyNAS 300 out of its box. Just count the holes in its rear plate for a start. Four Ethernet holes will grab my attention every time, and it's equally exciting to see eSATA included. (But three of them? That's a lot of external drive boxes stacked pretty close to the back of the device, given eSATA's distance limitations. But I digress.)

Any illusion about all NAS boxes being the same gets quickly swept away when firing up this beast. I was a little short of room around my civilised network switch in the basement, so I started off with the ReadyNAS 300 in our living room. It scared me with a minute or two of maximum fan blast before settling down to the kind of ultra-quiet idle we've come to associate with modern devices. The front panel is cute, too, with a luminescent touch panel that lets you scroll through system messages and pick the odd basic option, but which fades away to nothingness if you haven't nudged it for a few minutes.

Okay, such tricky touches don't do much for my argument that dearer models do provide better utility. But, like all its brethren, the ReadyNAS 300 employs Netgear's custom ReadyNAS OS, and that offers a number of



"Any illusion about all NAS boxes being the same gets quickly swept away"

advantages: unlike NAS boxes based on Windows Server, it isn't beset by frequent and intrusive OS updates. And unlike some NAS OS rivals, Netgear does keep up to date with the shifting sands of Windows client security. I also like the idea of cloud-based access to the files on the machine, although it was a surprise to find that only now has this feature been enhanced to also permit cloud-based deposition of files via browser drag-and-drop. The hardcore techies will know the plethora of ways to deliver inbound new files, such as FTP and rsync, and this web-page dropper strikes me as one of those methods that's more natural for end users than

◀ Sometimes it's worth spending on higher-end kit, and the ReadyNAS 300 is a perfect example

for IT staff. That said, it's always stunned me to learn how hard it is to put this feature together on a web server, or to find it as a product feature.

Here's where I get properly confused as I work my way through the other features on the list. I'm going to skip all the stuff about combining pools of drives into ever larger volumes, because that sort of fingers-and-toes arithmetic is pretty discredited nowadays: the vendors all try to catch your attention with promises of what their kit can do whenever a disk goes bad, but without acknowledging that such events are terrifyingly infrequent with modern drives. Why "terrifyingly"? Because such rarity means that you're far less likely to acquire any expertise in what to do when one does go bad...

Anyway, best not to think about that. Think about this instead. Elsewhere in the new OS release notes there are summaries of features such as point-in-time, snapshot-based recovery, VM support, and the aforementioned cloud-based file access. My question, which isn't covered in depth in that manual, is whether you can freely mix all these features within the same logical NAS disk. Snapshotting VM virtual disks looks to be a painless process, until you try it that is. Point-in-time rollback of a disk with 1,000 files on it seems fair enough, but what happens with 330,000 files? Or two million? It seems to me that a broad approach to such features has to be accompanied with a bit of common sense on the part of the support and after-care organisation. (Incidentally, there is one of those – Netgear says you can have some phone support if you register the product.)

As for me, I'm going to have a play to see what happens if I make one big volume and then press all the buttons at once on all of these features, compared to what happens if I take the six disks in the box and make them into three mirrors: one for VMs, one for cloud-based file access, and a third one for point-in-time recovery. I can't really say why I think this might be the right way to go about using this box, because all these tests are far from short-term: formatting alone takes a matter of days. But I do believe that once you move beyond a single USB key in your back pocket, the different characteristics of storage do need some very careful consideration. ●



Public should get a say on treaties sooner. By **Ry Crozier**

Weatherall said that although there was some public discussion on treaties, "it is occurring on a completely ill-informed basis" and "in an atmosphere of high distrust." "We have the trade minister saying everyone is just fear mongering

"And I tell you: the libraries did not think that that was going to happen when we knew that we were in negotiations for the Australia-US Free Trade Agreement. So, without a certain level of transparency,

For more content like this, do please
visit the ACS Information Age website at
<https://ia.acs.org.au>



ARE YOU SICK OF SLOW, UNRELIABLE WI-FI? JON HONEYBALL IS ANGRY - AND DEMANDS CHANGE NOW

“When are we going to have a new generation of Wi-Fi for the home? The current solutions leave me angry beyond belief. Let's just look at some of the thinking that they embody.

First, the 2.4GHz radio space is fantastically oversubscribed. Try finding free slots: in a block of flats, you'll be lucky to find anything at all. Things are better in the 5GHz space, but that's only because few people have moved there so far. Down in the cesspit that is 2.4GHz, there are basically three channels that don't overlap. Do devices here follow a sensible arrangement, aligning themselves properly? Of course not. Base stations pop up wherever they like. Worse still, some grab extra space to try to get better throughput, ignoring the fact that the channel space is a shared resource.

Things get worse still. Your Wi-Fi base station may decide to “intelligently” choose the quietest slot when it turns on, but it's unlikely to change after that unless provoked. The protocol doesn't allow for a base to say to its clients, “Hold on chaps, I'm moving over to this new channel, follow me please.” Real radio solutions can channel hop, often dozens or hundreds of times a second. Wi-Fi sits there, shouting in a loud voice: “Hello! Hello! I'M HERE!”

Shouting? Oh yes. Find me a Wi-Fi base that automatically reduces its transmit power to be a good citizen, and thus works co-operatively with others around it. No, they all come nailed to full power, in a Clarkson-style shouty rage. Having a higher transmit power than necessary isn't only unfriendly to your neighbours, it's a security risk too. Higher power means bigger range, means more likelihood

that you're spilling outside of your house, and thus makes it easier for hackers to access your network from a car parked on the street.

Want to be helpful and reduce the power? Try diving down into the utter horror that is the web-based management screen, and see if you can find the setting. Don't even get me started on the utterly execrable setup and configuration screens. I might be

“We need something that can self-configure; something that brings sensible reporting to the user”

willing to give manufacturers more credit if their base stations had Wi-Fi on/off switches prominently mounted on the case, but no: you can't even easily switch off the thing when you don't need it.

And do I need to rant about how Wi-Fi routers assume that they're the centre of your entire world? Deciding that it's perfectly alright to run network address translation (NAT), even though the “WAN” port may have been through NAT on your ADSL router already? Only last week, I had to troubleshoot a neighbour's Wi-Fi network, where different computing devices were visible or invisible depending on which of the Wi-Fi bases you were connected to.

Also, Wi-Fi has no concept of the protocols running over the connection, so there's no way to ensure that critical streams such as a videoconferencing session with your mother will continue to work while someone plays a bandwidth-hogging game on the Xbox.

Why are these devices so dumb? Why is the underlying protocol so stupid? Why, in 2015, are things no better than they were in 2005? The answer, of course, is inertia. 802.11 goes back years, and even in its most recent incarnation via the 802.11ac specification, it still brings along barrow-loads of historical dead weight.

We need a clean sweep. Something much smarter. Something that can self-configure, self-heal; something that brings sensible reporting to the user. Something where you can have picocells in each room, rather than trying to get a sledgehammer Wi-Fi base station to shout across your entire house or apartment. Something with a little finesse, and consideration for other users. Something that allows you to meaningfully prioritise specific data types, so your streaming TV feed of the cricket isn't interrupted by little Johnny doing yet another Windows update.

This isn't a difficult problem to solve. The issue is one of standards committees, which often take an age to deliver far too little. Indeed, even in the world of 802.11, there were vendors that shipped so-called draft-n devices before 802.11n was ratified. And the same happened with 802.11ac. It took some five years to get ac ratified; the same for 802.11n before it.

This simply isn't good enough. Would someone big please fix all of the nonsense, come up with the new specification, build some silicon and ship the damn thing? It would take a company such as Apple or Intel to do this. In the meantime, we're being held hostage by brain-dead solutions that were inadequate a decade ago, are deeply annoying now, and will be laughable in the future.



Level 6, Building A, 207 Pacific Highway,
St Leonards NSW 2065
Locked Bag 5555 St Leonards NSW 1590
Chief Executive Officer David Gardiner
Commercial Director Bruce Duncan

This magazine is published by nextmedia Pty Ltd ACN 128 805 970, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065 © 2014. All rights reserved. No part of this magazine may be reproduced, in whole or in part, without the prior permission of the publisher. Printed by Bluestar WEB Sydney, distributed in Australia by Network Services. The publisher will not accept responsibility or any liability for the correctness of information or opinions expressed in the publication. All material submitted is at the owner's risk and, while every care will be taken, nextmedia does not accept liability for loss or damage.

Privacy Policy

We value the integrity of your personal information. If you provide personal information through your participation in any competitions, surveys or offers featured in this issue of Inside Sport, this will be used

to provide the products or services that you have requested and to improve the content of our magazines. Your details may be provided to third parties who assist us in this purpose. In the event of organisations providing prizes or offers to our readers, we may pass your details on to them. From time to time, we may use the information you provide us to inform you of other products, services and events our company has to offer. We may also give your information to other organisations which may use it to inform you about their products, services and events, unless you tell us not to do so. You are welcome to access the information that we hold about you by getting in touch with our privacy officer, who can be contacted at nextmedia, Locked Bag 5555, St Leonards, NSW 1590

PERMISSIONS & REPRINTS: Material in **PC & Tech Authority** may not be reproduced in any form without the written consent of the Commercial Director of nextmedia. Quotations for reprints are available from the Production Manager. **PC & Tech Authority** logos are trademarks of nextmedia Pty Ltd. This magazine contains content that is published under license from and with the permission of Dennis Publishing Limited. All rights in this material belong to Dennis Publishing Limited absolutely and may not be reproduced, whether in whole or in part, without its prior written consent.

EDITORIAL

Editor: Ben Mansill:
bmansill@nextmedia.com.au
Art Director: Tim Frawley
Digital Editor, Tech and Gaming:
David Hollingworth:
dhollingworth@nextmedia.com.au

REGULAR CONTRIBUTORS

Jon Honeyball, Paul Ockenden, Davey Winder, Steve Cassidy, Sasha Muller, Darien Graham-Smith, Nicole Koble, Tim Danton, Jonathan Bray, Bennett Ring, Anthony Caruana, Daniel Wilks, Mark Williams, Rob North

EDITORIAL INTERNS

Angus Baillie, Alessandro Guarera

PRODUCTION

Advertising Coordinator: Melanie Ballard
Production Manager: Alison Begg
Circulation Director: Carole Jones
Printed by: Bluestar WEB Sydney
Distributed by: Network Services Company, Australia; Netlink, NZ

ADVERTISING

Phone: (02) 8399 7603 Fax: (02) 8399 3622
Group Advertising Manager:
Joanne Ross: jross@nextmedia.com.au

SUBSCRIPTIONS

1300 361146
or subscribe@mymagazines.com.au

nextmedia



Printed on paper sustainably sourced
from PEFC certified forests



Please recycle
this magazine

Pioneer of Innovative Technology

Introducing our new range of cloud server and storage solutions

DreamMicro SOHO Server 1U 5018A-MLTN4 From \$849

Intel Atom
C2550

2x FIXED
Drive Bays

IPMI 2.0 with
KVM over LAN



- Intel® Atom™ Processor C2550
- Up to 64GB DDR3 1600MHz ECC/non-ECC UDIMMs in 4 slots
- 2x 3.5" Fixed SATA3 HDD Bays OR 4x 2.5" SATA2 (optional)
- 1x PCI-E 2.0 x8, 1x PCI-E 2.0 x4 Expansions Slots
- Quad GbE ports, IPMI w/ dedicated LAN
- 200W Low Noise AC-DC Power Supply with PFC

DreamMicro Power Server 1U 5018D-MTF From \$1,249

Intel Xeon
4th Generation

4x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 1x Intel® Xeon® E3-1200 v3 4th Generation Processor
- Up to 32GB DDR3 1600MHz UDIMMs in 4 slots
- 4x 3.5" Hot-swap SATA3 HDD Bays
- 1x PCI-E 3.0 x8 (in x16) Full-height Expansion Slot
- Dual Gigabit LAN (1x Intel® I217LM & 1x Intel® I210AT)
- 350W Gold Level Power Supply

DreamMicro Power Server 1U S100-L11L From \$1,499

Intel Xeon
4th Generation

12x FIXED
Drive Bays

IPMI 2.0 with
KVM over LAN



- 1x Intel® Xeon® E3-1200 v3 4th Generation Processor
- 4x DDR3L 1333/1600MHz ECC UDIMM slots
- 12x 3.5" or 2.5" SATA fixed HDD/SSD bays
- 1x PCIe G3 x8 slot (x 8 signals) Slot
- 1x Intel® 82599ES 10Gb SFP+; 4x Intel® 82574L GbE RJ45
- 1x fixed 80plus gold-level 400W Power Supply

DreamMicro Power Server 1U S100-X1S1N From \$1,149

Intel Xeon
4th Generation

4x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 1x Intel® Xeon® E3-1200 v3 4th Generation Processor
- 4x DDR3L 1333/1600MHz ECC UDIMM slots
- 4x 3.5" or 2.5" hot-plug HDD/SSD bays + 2x fixed 2.5" bays
- 2x PCIe G3 x8 mezzanine slots (x 8 signals)
- 2x Intel® I210 GbE RJ45 ports
- High efficiency 400W Power Supply 80 Plus Gold

DreamMicro Power Server 1U D51PS-1U From \$2,399

Intel Xeon
E5-2600/v3

4x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 2x Intel® Xeon® Processor E5-2600 v3
- 16x DDR4, Up to 2133MHz RDIMM/LRDIMM
- 10x 2.5" or 4x 3.5" Hot-plug HDDs
- 1x PCIe x16 G3 slot for low-profile card or mezzanine
- Intel® I350 1GbE RJ45 ports
- 1+1 High efficiency redundant hot-plug Power Supply

DreamMicro Power Server 2U 5028R-WRF From \$2,299

Intel Xeon
E5-2600/1600v3

8x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 1x Intel® Xeon® Processor E5-2600/1600 v3
- Up to 512GB ECC DDR4, Up to 2133MHz; 8x DIMM slots
- 8x 3.5" Hot-swap HDD bays
- 4x Full-height x8 & 1x Low-profile x8 slots
- Integrated IPMI 2.0 and KVM with Dedicated LAN
- 500W Redundant Power Supplies Platinum Level (94%+)

DreamMicro Power Server 2U 6028R-WTR From \$2,799

Intel Xeon
E5-2600/v3

8x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 2x Intel® Xeon® Processor E5-2600 v3
- Up to 1TB ECC DDR4, Up to 2133MHz; 16x DIMM slots
- 8x Hot-swap 3.5" SAS/SATA HDD bays
- 4x PCI-E 3.0 x8 (2 full and two half length) slots
- Intel® I350 Dual port Gigabit Ethernet Controller
- 740W Redundant Power Supplies Platinum Level (94%+)

DreamMicro Power Server 2U D51B-2U From \$2,699

Intel Xeon
E5-2600/v3

12x HOT SWAP
Drive Bays

IPMI 2.0 with
KVM over LAN



- 2x Intel® Xeon® processor E5-2600 v3
- 24x DDR4, Up to 2133MHz RDIMM/LRDIMM
- 24x 2.5" or 12x 3.5" Hot-plug HDDs
- 4x PCIe x8 G3, 1x PCIe x4 G3 low-profile + more
- Intel® I350 GbE RJ45 OR Intel® X540 10GbE Base-T RJ45
- 1+1 High efficiency redundant hot-plug Power Supply

DreamMicro Power Workstation 7048A-T From \$2,499

Intel Xeon
E5-2600/v3

8x HOT SWAP
Drive Bays

4U
Rack Mountable



- 2x Intel® Xeon® Processor E5-2600 v3
- Up to 512GB ECC DDR4, Up to 2133MHz; 16x DIMM slots
- 8x Hot Swap 3.5" SAS/SATA HDD bays
- 3x (x16), 2x (x8), 1x (x4) PCI-E 3.0 expansion slots
- Intel® I210 Dual port Gigabit Ethernet Controller
- 1200W High efficiency Power Supply w/ PMBus

All prices include GST, exclude freight, all images are for illustrative purposes only. Errors and omissions excepted. Free 1 Year On-site Pickup & Return Warranty, 2 and 3 Years Optional.

• ISO 9001 Quality Endorsed Company QEC11489 • Commonwealth Government Endorsed Supplier 263 • State, Local, Government, Education Contract Supplier

PIONEER COMPUTERS

Build your own dream!
www.pioneer.net.au
1300 883 218 / sales@pioneer.net.au

Unit 2, 37 O'Riordan St, Alexandria NSW 2015 Australia
NSW: (02) 9690 2888 QLD: (07) 3257 3879 VIC: (03) 8790 1830 NZ: (649) 377 0497 Fax: (02) 9690 0333

Dreamcare.com.au
New online service and support
for all brands of PCs, Notebooks
and Servers.

GIGABYTE™

P55 GTX 970M 15.6" GAMING LAPTOP

MASSIVE INVASION

5th Gen Intel® Core™ i7 Processor



Dual Storage: Up to 512GB
mSATA SSD + 2TB HDD



1080p Full HD Wide View
Matte Display



Dolby® Digital Plus™
Home Theater

PLACE TO PURCHASE

MSY Technology
VIC. NO. 950, 9A, 9A ACT



scorptec

GO KONG
WWW.KONGCOMPUTERS.COM

Online Centre Pte. Ltd.

FRAG LABS
THE SCIENCE OF GAMING

MADE in TAIWAN

Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries. The entire materials provided herein are for reference only. GIGABYTE reserves the right to modify or revise the content at anytime without prior notice.